

# AVIATION WEEK

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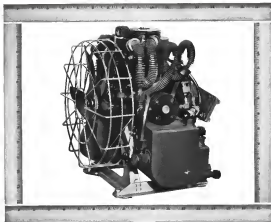
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## NEWS DIGEST

### Domestic

Pace talks between American Air Lines and Air East flights have broken off, and ALPA was trying to determine last week whether the No. 1000 National Board has recommended production in the domestic market over the 1971 model. If the talks are not resumed, the union probably will set a new date for the strike, originally scheduled for July 15. Said NMB member Everett Tal-wald: "We are awaiting further developments."

**ZNIG-1** Map, Concorde Aircraft Corp.'s new subsonic craft, has completed its first flight. The 275-hp Navy biplane is powered by two 500-hp Custer-Wright Cyclone 7 engines with Custer Electric Ecto-Prags, specially developed for lighter-than-air ships.

**Lockheed Aircraft Corp.'s** George Division is putting a USAF B-47 through modification, respectively and open heart at Marietta under a new Air Force contract designed to keep planes up to the most modern configurations at all times. The modification program is expected to continue through January 1977.

New USAF weapons will be developed by Ford Motor Co. under a classified contract totaling approximately \$1 million.

**Republic Aviation Corp.** has moved its corporate headquarters to the 125th Street tower project from New York to a new office designed under the roof of its main assembly plant at Farmingdale, N. Y. The transfer is designed to speed work on the project for bringing Republic closer to production personnel.

"Go now, pay later" credit plan for world jet travel is being offered by American Airlines, leaving no down payment and up to two years to pay.

**LT. Gen. Robert R. Hanson** has been appointed superintendent of the new Air Force Academy, will supervise the staff and direct the school's opening next year at temporary quarters at Lowry Field in Denver.

**Aircraft Engineering Foundation**, made up of C-46 operators, has offered to buy 50 of the twin engine transports now leased from the Air Force.

**Sperry Gyroscope Co.** Civil North, N. Y., has won a new USAF contract



### Boeing 707 Beats Comet 3 Into the Air

A new chapter in trans-Atlantic jet transport ended last week when the Boeing 707 Stratoliner-Britainair (top) made its first flight less than a month after the Comet 3, shown just before takeoff July 19. The new Boeing has exceeded 100 mph. and goes higher than 42,000 ft. in its early flight with Seattle, Wash. (top p. 65). Three pictures show an interesting comparison of U.S.-British design philosophy in configuration of four-jet transports.

for more than \$7 million in additional Zero Reader flight systems.

**Dr. Albert Zelen, 51,** pioneer aviation scientist who built a wind tunnel at the University of Notre Dame 20 years before the Wright brothers' first flight, died July 27 at South Bend, Ind.

**C. T. Meyers, 68,** public relations director for Air France, died July 26 in New York.

**Frank B. Chelwick,** secretary and service parts manager for Armstrong Motors, Inc., Syracuse, died July 11.

### Financial

**Douglas Aircraft Co.,** Santa Monica, Calif., reports net earnings of \$19,175,599 from sales totaling \$493,093,297 for the six months ended May 31, compared with a \$19,042,775 net and \$493,778,761 in sales for the same period last year. Backlog June 30: \$1,902,683,000.

**Glen E. Martin Co.,** Baltimore, had

a net income of \$6,842,032 for the first half of 1974, a \$2,538,837 increase over the first six months of last year. Sales totaled \$97,204,917, compared with \$93,932,777 for 1973's first half.

**American Airlines** had a net profit of \$5,014,900 for the first half of 1974, dropping from \$6,018,000 for the first six months of last year. The net included a \$900,000 credit on the sale of four DC-4s. Operating revenues increased from \$98,849,516 to \$111,236,667. Principal reason for the profit drop: 4% reduction in load factor plus increased expenses.

### International

**Indian Airlines** has decided to buy eight jetliners, Vickers Viscount transports for its domestic routes.

**Shen Mitsubishi Roengokid, Ltd.,** has signed an agreement with North American Airlines to manufacture F-56 non-structural cargo parts at its Tokyo plant and repair and overhaul T-28B Sabers.







Regardless of evasive action

this radar-guided missile

intercepts bombers at supersonic speed

## Nike—product of teamwork

Now going into service as part of our nation's air defense system, the Nike's Nike has already brought down high-flying, radio-controlled bombers during simulated attack.

The team chosen by U.S. Army Ordnance Corps to develop and build this vital defense weapon consisted

Bell Telephone Laboratories, Western Electric Company, and Douglas. The Nike missile, now in volume production, is directed by a guidance system which keeps it "on target" despite any evasive action.

As the nerve-muscle of intercept, Nike's scheduled explosion. The target is destroyed. Highly mobile,

the entire system can be moved by air, and with troops in the field, or to replace and overhaul guns in defense of fixed installations.

Selection of Douglas to develop the Nike airborne components leads into its missile engineering. Selection to build the missile's volume components—fire Douglas "plus"—manufacturing dependability.

Depend on **DOUGLAS**

First in Aviation

## WHO'S WHERE

### In the Front Office

W. A. DeHaven has stepped in head shoes and a double-breasted Marine Corp. will be retained by the San Francisco company in a contract.

McGough South, chairman of the Florida Power & Light Co., has been elected to the board of Federal Air Lines. Kenneth Elmer has been named by EAL to assistant president and James C. Wadick to assistant secretary.

### Changes

Georg F. Brannstrom, former manager of Air Transport Ass'n's tactical regional operating office in Chicago, has become director of the Air Navigation Traffic Control Division at ATNA's Operations Department.

Alexander L. Anderson, former public relations director for Northwest Coast Air Lines, has joined Lockheed Aircraft Corp. in New York and Washington, D. C., public relations representative. Rodgers Donaldson, former Lockheed stress engineer, has rejoined the company as assistant chief engineer.

Thurston Klepman, director of engineering research and development for Isaac Engineering Co., New York, has taken an additional doctor in civil engineering.

David B. Adler has been appointed to district engineering manager for General Electric Division.

Larry Oswald has been promoted by National Airlines to public relations manager for the carrier's New England and mid South routes.

William C. Hoffman is now permanent director for the American Division of Kaiser Metal Products, Inc., Boston, 72.

Alfred W. Johnson has become manager of advertising and sales promotion for Reine Industries, Santa Barbara, Calif.

James H. Lombard has been appointed sales manager for Canadian Aero Services, Ltd., Ottawa.

Thomas H. Bee has been promoted to vice manager for Franklin Industries & Company Corp.'s Professional Division, Hicksville, N. Y., replacing Stuart Elgert, who resigned to join Perini, Inc., Oakland, Calif.

Victor F. Kay has become plant superintendent for Universal Metal Products, Inc., Alhambra, Calif.

### Honors and Elections

Ray T. Harley, president of Corbin-Wright Corp., and its other aviation leaders have been appointed to the advisory board of the 1957 International Aviation Show, to be held May 4-5 in New York. The advisory industry board includes Richard S. Boudelle, president of Fitchell Engine & Auxiliary Corp., Ross Allen, Richard E. Reed, Robert W. Fennell, president of Fitch Corp., Richard Robert M. Dabney, president of Dabney Aircraft Service, J. S. Rink, president of the Majestic Air, and E. M. Brinkman, public relations manager for Sikorsky Aircraft.

## INDUSTRY OBSERVER

Two Lockheed subsonic aircraft, the B-7V-2 and C-130, now are scheduled for test flights in August. General's XV-1 helicopter is not expected to begin vertical takeoff and landing until September.

North American Aviation's second TF-86 two-place trainer is ready for first flight and soon after will begin a tour of Air Force bases. First test tour was completed when the original TF-86 was lost in a crash which took the life of test pilot Joe Kovich (Aviation Week May 29, p. 15). NAA pilot Charles Galtzert, who took the T-28B on a similar USAF test tour, is scheduled to pilot the TF-86 on the trip.

Nike subsonic guided missiles will be produced at Charlotte, N. C., electronically in 1958. Government facilities there will be operated by Western Electric Co. and Douglas Aircraft Co. Both firms now are producing Nike missiles.

Bids as solutions for air traffic are being sought by National Advisory Committee for Aeronautics. Aeronautics probably will be used for use in NACA's research program on best problems of high-speed flight being conducted at Wallops Island, Va.

All of the Strategic Air Command B-36 and B-36-1 wings have demonstrated their ability to keep their aircraft flying for a total of 1,000 hr or more during a single month. Latest B-36 wing to reach this operational status did so only one month after being equipped with the intercontinental bomber.

Pratt & Whitney Aircraft finally has lifted the wraps on its new jet turbine blade called Waspaby, PW-WA credits the alloy with allowing higher operating temperatures in the J48 centrifugal turbojet and playing an important role in boosting J48 thrust from 6,250 lb to 7,250 lb without afterburner. Waspaby has been used on the J48 for several years.

U. S. aircraft industry is beginning to scramble over the \$750,000 deal presented by the Foreign Operations Administration to finance British production of Vickers Viscount bombers for the Royal Air Force with American taxpayer dollars. Shortly after FOM made its deal on the Viscount, the British Ministry of Supply announced placing a production order for V-1000, the military transport version of the Viscount. Question asked by U. S. industry: "Is FOM really financing British jet transport competition for U. S. aircraft manufacturers with taxpayer money?"

A staff report critical of the British aircraft program—and raising the question of continued U. S. financing of it—on the basis of weakness of the Senate Appropriations Committee, who will start consideration of design aid funds this week.

Delaware announced on the Boeing B-52, as even the current trend toward larger bombers by entering to a jet having mounting four 55-cwt. machine guns. Test tanks have been installed and flown on a B-52 and are being installed on a pair of B-47 test beds.

Rad air force men "throwers" hit by field maintenance at its aircraft. Mechanics threw parts loose, already packaged with a set of cheap tools which are not put for the job and thus discarded.

U. S. Army is pushing program under which transport helicopters would be loaned to commercial operators for scheduled operations as an auxiliary service tool. Congress has been approved by Chief of Staff Gen. Matthew B. Ridgway, but needs approval of Secretary, Service and civilian legislation, which must originate in the office.

Cessna's XV-1 vertical-takeoff fighter is expected to make its first free lift-off by Aug. 11 at Mendenhall Field, Calif. It will be a half vertical take-off to maximum height of 20 ft in 10 sec. First full flight will take place for another month and will be at a Navy field near San Diego.



## Reds Strengthen Far East With MiG-17s

- New jet fighter boosts Communist airpower in area to 7,500 planes, three times greater than FEAF.
- Surprise attacks from bases stretching from Siberia to China could overwhelm outnumbered U.S. forces.

By A. W. Jessup  
(McGraw Hill World News)

Tokyo—New Russian fighters, bigger and better than the MiG-15, in operating in increasing numbers in the Communist Far East. Discarded the MiG-17, that jet fighter looks much like its older brother but is bigger, faster and climb better.

Gen. E. F. Portridge, commander of Far East Air Forces, recalls the MiG-17's presence in this area is a review of the present Far East air situation.

He also says that as strength in the Soviet Union totals 7,500 aircraft, not including 12 AF-100s, that is not.

Even without modern weapons, this means Communist air forces could overpower FEAF's skilled but vastly outnumbered units with surprise attacks from the extensive Red airbase complex, stretching from Siberia through Manchuria and China.

► **Combat Develops**—This new fighter probably results from the high level of combat held in Moscow by the Soviet fighters consumed in late 1951 or early 1952. At that time, the Red air leaders removed the deficiencies of the MiG in combat with the F-86 and North Korea. As a result, the MiG-17 probably represents a blended central synthesis to improve its maneuverability at all altitudes and enhance fighting equipment modeled after U.S. rights acquired from F-86s and F-84s downed in the Korean War.

Significantly, the new fighter in action in southern areas the Russians meet by producing as quantity as possible with a Soviet acquisition 10,000. The original MiG-15 engine developed 6,000 hp, that.

At the time, two Siberia were straggling along on 5,000 hp.

Assessment of the new fighter is on balance, but not will be the case, as that of the MiG-15. Factors combine down of 37 mm cannon and 23 mm machine guns.

► **New Fighter**—The first MiG-17 was sighted in the spring of 1953. Several Soviet pilots reported at that time seeing

a new and different fighter at long range. Two American fighters considered this, but they thought they had seen something of extremely high altitude, perhaps 60,000 ft or more, over MiG-15s in late 1951 or early 1952.

It was not until the MiG-17, that jet fighter, also appeared in this year's Soviet air day display June 20 at Moscow's Tushino Airport (Aviation Week, June 23, p. 15).

Gen. Portridge says there just is no comparison between the MiG-15 and the MiG-17. He flew the MiG-15 in which a disabled North Korean escaped last fall, while on his way to the Far East only this year. "I wish I had known that (while he was commanding the Far East Air Force in Korea when the MiG-15 first went into action) what I knew now about the MiG," the general laughs.

► **Key Strength**—The Communist air force—Soviet, Chinese, and North Korean—has its practical purposes one and the same. "Portridge reports in his assessment of potential enemy air strength.

### FEAF Nightmare

(McGraw Hill World News)

TOKYO—Outstanding middle power not strength within Far East Air Forces is a daily nightmare.

All but one or two combat veterans have been rotated out at Kanto. And there is not one combat-tested unit ready left at ground or squad level.

Each unit within the command has different loads of duty for its units. And within each unit, different units might apply—depending on mutual status and whether depends on with the office on related work.

The Korean force is 12 units. The command in Japan has no office where there is only one in 36 months. On Okinawa, it is two years, and on Guam 30 months.

"They have in this area over 7,500 aircraft of various types, and with the extensive airbase complex available to them, they should be able to shift their strength around to achieve considerable flexibility."

On its own level, Gen. Portridge states: "At present, FEAF is the best-trained, best-equipped, most powerful battle-tested tactical combat force in the world."

Continuing on the problem of continuing U.S. taxpayer allocation is Asia, he says. "The situation is severely different today from that which existed in the early months of the Korean war. Then we struggled with the concept of an air defense force in a tactical air force in addition to obtaining the necessary facilities from which to operate."

Today, he has a large tactical air force—such as all the essential elements of air pilot, communications and construction ability—being in the Far East."

► **Defense Changes**—Despite the greater readiness of FEAF, Communist air strength and the ground sides of the Korean conflict have a drastic change upon the picture of FEAF. Two objectives are sought by Gen. Portridge:

► **Dispersal** of his forces against sudden surprise attacks. (General HAP, head of the Korean conflict force, a drastic change upon the picture of FEAF. Two objectives are sought by Gen. Portridge:

► **Expansion** of U.S. forces. Two of his bases are only 75 miles away from the major bases in Japan, and only 30 miles away from Seoul in Korea.

► **Stability** of his personnel to maintain combat readiness.

Modern aircraft facilities depend. Without them, the position in Korea would be highly unstable. No new aircraft or new weapons of any kind can be moved into Korea.

Units there, for example, cannot be equipped with the F-86D fighters now beginning to come to FEAF. But such are retained in this new fighter in Japan. If that the Korean side, the command move into Korea in less than two hours.

While this is a help, the general would like to rotate whole units into Korea for two to three months and then out. But this would violate the rule.

(Over time on Gen. John E. Hill's agenda for his discussions in Washington might well be permission to waive this prohibition in the light of the Communist air buildup in North Korea in violation of the ceasefire agreements.)

Fighters are kept at Kanto. But only F-86Es and F-4s, F-4Es and G-4s, F-4Es and F-4Es are allowed. In addition, there are some Marine F-4Es, A-1Hs and F-4Us.

► **Weather Strength**—Weather strength is dropping more further back than Japan. None ever was based in Korea.

The B-29 group still at Okinawa as scheduled for return to the U.S. soon for re-equipment. That will leave only a Strategic Air Command B-29 group at Guam. This undoubtedly will be replaced soon by a B-47 group.

Then the bomber may make trips as well as Japan. The recent surprise flight from Okinawa checked out the readiness of facilities here. But some will be stationed west of Guam.

## ANG Pilot Sets New Speed Mark in F-86

DETROIT—An Air National Guard pilot set a new speed record at 700 mph in the first Rocky Mountain Thunder race at the Detroit annual Aviation Exposition and Air Show.

Past Lt. Charles J. Young's North American F-86 streaked across the finish line in the 1,515 ft. race in 1:10.4, the largest crowd in the history of the Detroit Air Show.

His home from Ontario, Calif., to Detroit-Wayne Municipal Airport, took him 17 min. 35.4 sec., including two landing stops that took approximately one hour.

National Automatic Airspeed later his average speed at 700 mph, breaking the 555 mph record set over approximately the same course in the 1951 Bonds Trophy race by Col. Keith Conquest.

Young set his fastest recorded 700 mph at times during takeoff from about 70,000 ft. near South Bend, Ind., at the end of the race.

Peasants got back off from the West Coast, three failed to finish. One plane failed to start. An alternate F-86 pilot was killed July 21 when his plane crashed during a night approach at Kalamazoo, Mich.

### 707 Exclusive

An exclusive engineering report on the flight test program of the Boeing 707 jet transport appears on page 61 of this issue. David A. Anderson, Aviation Week's engineering editor, spent a week in Seattle during the test program discussing the 707 project with most of those responsible for America's first jet transport.

Anderson interviewed top Boeing officials, engineers, designers, technicians, pilots and others participating in the project and watched some of the initial test flights. A second 707 engineering report will appear Aug. 9.

## Symington Warns of Red Missiles

Senator predicts Soviet will have intercontinental types in sufficient quantity in 5 years to hit U.S.

By G. J. McAllister

Congressional critics of the U.S. missile development program continued last week in Defense Department official program in a U.S. Senate plan to test and produce jointly certain results.

Developments are:
 

- Sen. Stuart Symington, former Secretary of the Air Force and now Democratic spokesman on air weapons, warned on the floor of the Senate.

I believe that within five years there will be a chance that will be enough intercontinental ballistic missiles, with hydrogen warheads, in the possession of the Soviet Union to deliver in all-out attack against the United States.

"Practical prototypes of these weapons already exist."

► **Defense Secretary Charles E. Wilson** and U.S. and Russian air "clashes" in evaluating some types of missiles for testing or production. Joint studies have been on certain missiles as "very desirable," Wilson said.

► **Field Marshal Alexander**, British Minister of Defense, late last week completed a 10-day inspection of U.S. missile test centers and manufacturing facilities.

Marshal Alexander's visit came just a little more than a month after Duncan Sandys, British Minister of Supply, completed a similar visit with U.S. officials "with the object of securing more active cooperation in this field" of guided missiles (Aviation Week, Week June 21, p. 16).

► **House Report**—These developments occurred shortly after a United States Appropriations Committee report on present missile efforts. Defense Department now is engaged in preparing a report on the progress for the committee. It is due in mid-July.

► **Sen. George, Special Assistant to the Secretary of the Air Force for Research and Development**, this completed an intensive review of guided missiles for Defense Department (Aviation Week, May 15, p. 70). The report, still checked by security, is considered primarily with the cost of missile programs and expenditures of depletion among the services.

► **Red Weapons**—Sen. Symington's forecast and articulate call of the Defense Department's "new look" defense program against the Soviet force to more against the present program.

"The United States is not spending enough money for national defense and what is relatively more important the



SYMINGTON: New assessment with large



WILSON: Missile situation is desirable.



ALEXANDER: His report, more cooperative



money that is being spent is not being allocated to provide the weapons need today," Symington said.

"Without a few years it will be possible to deliver strong and hydrogen weapons by integrating atmospheric nuclear reactors, descendants of the old German V-2."

"That weapon was most effective over 10 years ago—and it is dangerous to not national security that since then we have not followed the Commission's recommendations on its program."

Symington described the Red missile:

- It will have a range of 4,000 to 5,000 mi and carry hydrogen warheads.
- It will need protection against destruction by atmospheric friction because of its high reentry altitude and stability of descent.
- It will be guided only during the last portion of the climb but so precisely that even an accuracy will be measured in hundreds of yards.
- It will be no responsibility to throw the missile off course as it approaches the target since it is not dependent, at that stage, on guidance system.

The electronic and computer systems of nuclear defense are so integrated to be virtually useless against such a missile barrage. "No credible method of intercepting or defeating them has been developed, even in theory," Symington said.

For the first time in their history, the American people must now live up to the full meaning of vulnerability. Today nations could be destroyed as quickly and as completely as in the past a nation of soldiers could be defeated, or a ship sunk."

Symington's solution "Our main hope would appear to be concentration on the development and production of the new weapons."

• **Realistic Steps**—Sen. Leverett Saltonstall, chairman of the Armed Services Committee, urged Symington as a leader to develop the program.

Regarding the defense program, Saltonstall said: "Most we not proceed with realistic steps, and take the steps we can use and make them practical." Symington said he was glad that the Senate "has asked me if I am in favor of an early ending. I am slightly agree with him."

**Substantive** "Does the Senate know of any attempt on the part of the present Administration to consult first members of Congress and the American people generally are facts in case legislative change will tend to security?"

Symington "The answer is that we are in a very difficult position, but we can give the best possible answer."

**Substantive** "I shall leave it to that and debate the question with the Senate later."

**Minute Vote**—While Sen. Symington spoke in the Senate, Field Marshal

Alexander, accompanied by top British defense officials, was visiting the Air Force Missile Test Center at Patrick AFB, Fla.

Observers noted that each point on the tour taken by Marshal Alexander was concerned wholly or partially with missile development, testing or production. In addition to Patrick AFB, Alexander visited:

- Aberdeen Proving Ground, Md. Army Ordnance Center.
- White Sands Proving Ground, N.M., Army Missile Test Center.
- Fort Bliss, Tex., Army center for missile test missile testing.
- Edwards AFB, Calif. flight test center for USAF and National Aeronautics and Space Administration.
- Douglas Aircraft plant at Los Angeles, where the Nike and Honest John are in production.
- Naval Missile Test Center, Point Mugu, Calif.
- Boeing Aircraft plant, Seattle, Wash. where the Boeing F-99 anti-aircraft missile system is under development.

## AMC Reorganizes Procurement Setup

An Air Materiel Command Directorate of Procurement and Production now organized last week in an effort to increase the amount of delegated authority and prevent further isolated units USAF's chief buying responsibilities. It is a general streamlining of branches to division status and of former divisions to staff level, offices were created for three new deputy directorates under Maj. Gen. Vincent F. Glenn, deputy director for acquisition planning.

• **Rep. Gen. Clyde H. Mitchell**, deputy director for production.

• **Rep. Gen. Vincent F. Glenn**, deputy director for acquisition planning.

The three new divisions, according to Gen. Baker, will have functions "similar to those of vice presidents charged with supervising, respectively, in industry. Consequently, they will make industry's problems in dealing with us easier since points of contact will be comparable."

• **Operations Research**—The general new role of the organization is necessary because "of the many new responsibilities with which the directorate has been charged since 1945. These include development of a large percentage of procurements and a rapidly increased span of operations in military procurement and production."

In addition to the deputy director, last week's change created six new divisions by consolidation of activities formerly conducted by branches. These offices are responsible directly to Gen.

Baker but will report to the deputies on all activity involving procurement, production or distribution.

- **The six new divisions:**
  - **Acquisition**, headed by Col. Hugh H. Blevins, will consist of three branches: procurement, flight and cargo and special aircraft.
  - **Aeronautical equipment**, headed by Col. Ellis B. Wilson, with four branches: powerplant, communications and photographic, instrument and sensors. This group takes over functions of the old aeronautical equipment and electronics branches.
  - **Aviation**, maintenance and service activities, headed by Lt. Col. Robert E. Lee, has four branches: vehicle, aircraft and engine, service, equipment and research and development.
  - **Readiness**, headed by Col. William H. Linnell, with three branches: transportation, weapons and plant clearances.
  - **Support**, headed by Col. James W. Clark, has four branches: equipment control, equipment distribution, cost and reporting and maintenance, contract distribution and files. These are operating divisions of the old procurement support branch.
  - **Industrial resources**, headed by Col. Henry G. MacDonell, with three branches: equipment and personnel—will fully benefit directly by the Production Resources Division.
- Under the new organization, research and development purchases previously handled by the research and design staff will now be assigned to the appropriate buying division.
- **New Assignments**—Gen. Thomas, shifted by his Division assignment from Norton AFB in Davis, Calif., is responsible for the worldwide USAF purchasing activity all over the world, including field procurement, local purchases by other commands, contract buying and major ARDC procurement.
  - **Gen. Mitchell**, deputy for production, has served as assistant to the director and chief of the old Procurement Division since he came to AMC headquarters in 1955. He now is in charge of production functions, also on a global basis. He will be responsible for manufacturing resources such as machine tools, facilities, manpower and materials in support of current production programs.
  - **Col. Cassano**, now in charge of mobilization planning, comes to AMC as a recent graduate of the Industrial War College. His position is an extension of the mobilization branch placed in mobilization plans, a job set previously under the Production and Resources Division of the directorate. He will create, evaluate and disseminate mobilization requirements information for the aircraft industry.



VICTOR in battle with Communist fighters off Hanoi was Douglas AD-4 Skyraider.



VANGUARD was L-7 pressurized fighter, improved version of Kansas La 5 pictured.

## U.S. Alert to New Red Air Attacks

There was no attempt of the Pentagon last week to minimize the seriousness of an air fight between the Communists, Laotian fighters and those U.S. center based planes off Hanoi Island in the South China Sea.

The Laotian move that dawned on a fight with two Douglas AD-4 Skyraiders and a Chance Vought F4U Corsair when the latter were attacked while searching for survivors of a C-47 plane. The Laotian DC-4, downed three days earlier by the fighters.

The U.S. was notified to take a new view of the situation it was in a critical one.

• **Engineer Myhrum**—The clock was not clearly unexpected as it was in the quick action by the Navy planes. They shot down the two Red planes before a group of Navy air fighters flying over could go into action.

Aviation Week predicted Aug. 19 (p. 13) that an explosive argument was brewing in Southeast Asia.

Adm. Felix S. Stewer, commander of the Pacific Fleet, and the U.S. planes acted in accordance with Navy policy of those back when they were used.

Communist China charged that the U.S. "violated" the air over Hanoi Island. Defense Secretary Charles E. Wilson said the battle occurred outside the 12 mi. zone of Hanoi.

U.S. State Department protested to the Chinese Red government, through British diplomatic channels, the "accidental" and "deplorable" attack.

• **Refutation**—Not—The Navy's action brought in protest from the Chinese. China's failure to fire back might have caused the Reds to believe Americans would not fight, and Sen. Hiram Fong said that caused most of the commensal reaction.

Wilson said the planes were operating from the Kansas Island and Philippine Sea.

Navy later said all three planes came from the Philippine Sea. Observers noted that presence of the carrier means that the First Fleet now has moved the Seventh Fleet in Asia waters. First Fleet had been based at San Diego.

Wilson's statement said the La 7 is a "new wing, single engine, repeated to be one of the Communist's latest propeller-driven fighters."

## Defense Fights Tax Levied on Aircraft

Los Angeles—Defense Department has predicted the more than \$190 million in costly tax assessments levied against local aircraft manufacturers for

plants and other equipment being produced for the armed services.

Los Angeles County has asserted it has the right to make personal property assessments on such items, notwithstanding that they are the property of the manufacturers before they are turned over to the government.

Representatives for the three members of the Defense Department appeared before the county board of supervisors to protest the assessments. Col. Robert Hunter of USAF's Judge Advocate's office spoke for the Air Force and Army, while Capt. Jerry Smith of the Navy Judge Advocate General's Office appeared for the Navy.

They pointed out that contracts between the government and the manufacturers call for passing of title to the federal government and therefore the state should be exempt.

The board last year denied permits of the aircraft manufacturers on the same basis.

The decision has been appealed to the courts.

## New Airport Financing Set Up by TWA Base

In an unusual deal that may set a precedent for future airport financing, Kansas City, Mo., has sold \$18.7 million in airport revenue bonds to finance a new airport terminal in Kansas City.

The airport will be built at the proposed Mid-Central International Airport, 15 miles from downtown Kansas City. Under the terms of the deal, TWA will lease the facilities for 30 years, starting Jan. 1, 1975, at \$1.5 million per year. The deal is considered the first in which a private airline company would not fight, and Sen. Hiram Fong said that caused most of the commensal reaction.

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Navy later said all three planes came from the Philippine Sea. Observers noted that presence of the carrier means that the First Fleet now has moved the Seventh Fleet in Asia waters. First Fleet had been based at San Diego.

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COMPOSITE-POWERED B-47B with 10,000 lb thrust J57s at wingtips and paired 5,200 lb thrust J45s ahead, gets off ground fast.

## B-47 Labs Step Up J57 Altitude Tests



WING-MOUNTED J57 on B-47B test bed (left) is compared with J47 on B-42.



READY FOR HOORAY to B-47B's wingtips, scooped J57 endures Wichita check.

Boeing Airplane Co. has completed two B-47B Stratojets to flying test beds for accelerated high-altitude flight tests of Pratt & Whitney J57 turbojets used as the large B-52 Stratofortress (Aviation Week Mar. 22, p. 9).

Technical elements believe the program is aimed at increasing the altitude ceiling of the B-52, currently understood to be limited by powerplant rather than by aerodynamic considerations.

► **Revised Pods**—Each of the modified B-47Bs contains a single J57 in each outboard pod, replacing the standard General Electric J47-13 turbines. Pods set of scooped B-52 design, modified to hold a single powerplant instead of the paired units on the big bomber.

One of the converted Stratojets now is being flown by pilots of the Flight and Air Weather Testing and Evaluation Branch at Air Research and Development Command's Wright Air Development Center. The second plane is at Boeing's Wichita Division.

These engine tests are part of a continuing program of high-altitude work being done by Boeing and the Air Force on the XB-53 and YB-52 bombers in Seattle. For reasons of economy in testing, Boeing engineers decided to mount the J57 engines on the B-47 for those special tests rather than to use either of the B-52 prototypes.

► **Simple Job-Modification**—of the Stratojets was done at Wichita.

Boeing says it was a relatively simple job, attributable to the podded powerplant pioneered by the firm. Standard inboard pods with paired J47 engines are retained in the test airplanes.

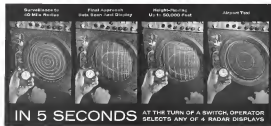
Installation of the powerful J57s increases the total thrust of the B-47B by about 50%. No modifications of wing pylon structure were necessary to handle the doubled thrust and increased weight of the big J57. —DAA

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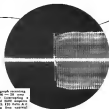








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found a day that could lengthen the life of the ocean at least another year at a cost of \$5 per seat. Thus lab experiments saved the airline thousands of dollars a year in seat costs alone.

Another saving element brought about is that of reducing Skidol by double fuel used in DC in its cabin taking a filtering process, then, it cleaned and Skidol for about 15 cents a gallon. When new, the hydrolic fluid costs \$12 a gallon.

► **Seawater Tests**—New materials and stress the airline consider having an subjected first to rigid tests by the China Life. Manufacturers send in samples of their wires. If they will stand the FAA seawater test, they will be bought.

Even though from certain material to corrosion checks and delinquency used to clean materials is checked by the lab. Because of the extensive of adverse conditions experienced by Pan Am on its worldwide routes, the chemistry experts also must test the effects of salt dew on materials.

One seat belt out of every 100 bought by FAA gets an extensive stretchability test to determine at what point the belt will break.

► **Workload Tests**—Not long ago, Pan Am began having considerable complaints from passengers that the free overnight bags the airline does were not holding up when passengers attempted to use them after the flight was finished.

Even though the bags were distributed free, FAA set its criteria on the test of the tensile force and now is testing a small piece separate from bag to its passengers. So far there have been no complaints.

Such small matters as the number of aircraft inoperative hours tend to spark when attention was checked because they were reduced to test in tropical climates. Now the matters are made of a special alloy that will not rot under tropical conditions.

In every such test, the chemical must duplicate the conditions found in the location. If used by an engine room will be "weathered" according to the climate desired in order to test a part set or item at sea.

► **Manufacturer Notes**—With all of its varied assortment of jobs in past years, PAA's Chen 13 has taken on the look of a miniature Bessie of Studebaker.

About 35 times a month are sent to the lab for study. Tests were repeated weeks and more often months before the solution is reached.

"Pack new steel gears was problem for us," Hendon says. "As the aviation industry grows more and bigger problems are generated, we must constantly patch our evidence and resources ourselves."

—BJ

## Arctic Sentinels

Thousands of miles away, long-range Northrop F-49 Scorpions stand guard night and day along the top-of-the-world route to America's heart, deterring our enemies and industry. These lethal USAF fighters will "screamer" as the first dash-warning from the polar arctic chain. With deadly armament, latest tactics, and ability to range over a distance once up to 2000 miles in depth, they can strike, follow, harass, and destroy an enemy before he can reach target. The Scorpion F-49 is America's most heavily armed fighter. It is a product of the previous line of Northrop fighters and machines.

## NORTHROP

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Pioneer Builders of Night and All Weather Fighters

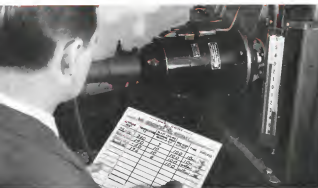






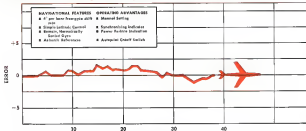


## New G-E automatic a-c electrical system



New G-E high-efficiency a-c generator has no bearings wear 1%, and offers full load recovery in about 1/10 sec. Available ratings: 30 to 60 kw, 285/420 cycles, 6700/1400 rpm, 175/350 volts.

## New G-E compass system reduces aircraft



Low drift of gyro system proved in laboratory and flight tests. The above drift curve was obtained during a rollpitch yaw test on a G-E gyro unit. This test, conducted by an aircraft equipment laboratory, showed that at no time did the drift rate exceed 4" per hour—66-80% reduction over previous systems. Flight test conducted later upheld the laboratory findings.

## delivers load at 260F

A new, fully automatic parallel a-c electrical system which efficiently normal manual switching, and delivers rated load at higher ambient temperatures than ever before possible, has been developed for jet aircraft by General Electric.

### Designed for supercruise dash

Designed specifically to meet the high ram-air temperatures of supercruise dash, this new G-E generator system provides the best voltage regulation and most advanced system protection available in production today. The automatic system delivers full load at:

- Sea level with 115 F cooling air at 16 inch water drop (continuous)
- 40,000 feet with -40 F cooling air at 30 inch water drop (two minutes)
- 60,000 feet with 140 F cooling air at 30 inch water drop (two minutes)
- 35,000 feet with 260 F cooling air at 1 inch water drop (two minutes)

### Speeds take-off, system pilot

The first completely automatic a-c system ever produced, the new G-E equipment begins operating as soon as the pilot starts an engine. The system contains only two toggle switches, which can remain "on" at all times unless a fault develops. This eliminates a series of pilot functions, and sharply reduces time required to become airborne after the pilot climbs into the cockpit. System control and protection is fully automatic.

### Single source for complete systems

General Electric offers a single source for complete a-c or d-c power generation systems for any aircraft. For more information, contact your nearest G-E aviation specialist, or write Section 210-66, General Electric Company, Schenectady 5, N. Y.



Major components of the new G-E system in addition to the generator are:

1. New duty machine (G-E)—designed to last the life of the aircraft (though regular is only 250 volts inches and weighs only 15 lbs.)
2. Control and protective equipment (light) automatically limits and isolates any faulty generator. Control panel weighs only 8 1/2 lbs. for a single-generator system and only 18 1/2 lbs. for parallel generator systems.

## drift rate 66 — 80%

A new compass controlled directional gyro system which offers a free-gyro drift rate of only 4" per hour—66 to 80 per cent more efficient than present systems—has been developed by General Electric for helicopters and fighter aircraft.

### Weights only 17.5 lbs.

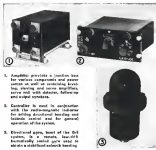
Compact and lightweight (approximately 17.5 lbs.), the MA-1 compass system is designed to meet the requirements of any synchronous compass indicator, and will operate from all compass transmitters built to Air Force specification AF-2733A.

### Accurate, stabilized heading information

The MA-1 system offers accurate, stabilized heading information continuously through 360° in aircraft when damped to the earth's magnetic field through a modern vertically mounted compass. Featuring a normal damping rate of approximately 2° per minute during compass controlled operation, the MA-1 system also provides for controlled lecture-dash compensation.

### Aircraft systems development

For additional information regarding reliable aircraft systems development, contact your G-E aviation specialist or write Section 210-66A, General Electric Co., Schenectady 5, N. Y.

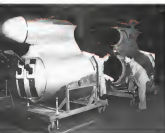


*Progress Is Our Most Important Product*

**GENERAL ELECTRIC**



## New G-E armament system gives jet bombers

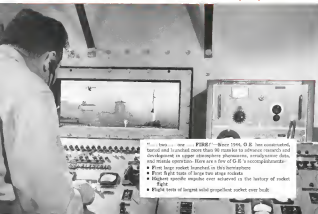


This new 30 mm system is a result of G.E.'s "integrated system" approach whereby a group of engineers is responsible both for development and modification of a system for greatest efficiency and ease of maintenance.



Cold and hot chambers with temperatures ranging from -60 F to 170 F are only two of the advanced tests G-E armament systems undergo to help boost maximum flight efficiency.

## New land-sea-air uses for rocket propulsion



- Since 1946, G.E. has concentrated, tested and launched more than 90 rockets to advance research and development in upper atmosphere phenomena, atmospheric data, and missile operations. Here are a few of G.E.'s accomplishments:
- First large rocket launched in this hemisphere
  - First flight tests of large two stage rockets
  - Highest specific impulse ever achieved in the history of rocket flight
  - Flight tests of largest solid propellant rocket ever built

## automatic defense

A remote controlled 28 mm armament system, capable of finding, tracking and hitting hostile aircraft even in the night or fog, has been developed by General Electric for high speed jet bombers.

### "Packaged" protection for B-47E and B-47C

Under security wraps for three years, the G-E fire control system provides some reliable, automatic protection for the Boeing B-47E and B-47C jet bombers. Compact, the 28 mm system is delivered packaged, tested, and ready to be installed as a complete test system.

### Automatic warning, tracking, correcting

The system performs the following functions:

- Provides automatic radar warning of approaching aircraft
- Automatically tracks and positions guns on selected target
- Continuously corrects for windage, ballistics, and lead errors by means of an electronic computing network
- Fires guns electrically when target is in range

### System Engineering

Bomber survival is increased as a result of this integrated, efficient, compact system. Complete system engineering is one reason why almost every U.S. operational heavy and medium bomber today is equipped with General Electric automatic systems. General Electric Company, Schenectady 3, N. Y.



Remotely-controlled G-E armament system gives the Boeing B-47E and B-47C jet bombers a heavyweight punch in the rear. Directed by radar, the 28 mm system can find and hit enemy targets.

## under study by G.E.

Ten years ago, rocket propulsion had but one use—to launch missiles. But today, rocket power is a source of high pressure, high speed, high temperature gases and power can be used in such applications as torpedoes, propulsion, catapult launchers, high speed flight, thrust augmentation, rocket booster and sustaining power, high speed research sleds, glider take-off and landing, supersonic wind tunnels, mining, plus many additional direct military and industrial uses which will be brought out by research and development.

Experience, manpower and facilities make it possible for G.E. to design and develop rocket motors or rocket propulsion systems for use on land, sea or in the air.

The assured growth of rocket propulsion offers a challenge to the ingenuity and capabilities of American industry. This challenge—to apply the tremendous power of rocket propulsion to ever more applications—can be met only through continuous research and development. To this end, General Electric offers its successful experience, its trained manpower, and its extensive facilities. General Electric Company, Schenectady 3, N. Y.



Progress Is Our Most Important Product

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800-MPH sled eventually will be tested at the 1,500-ft. Holloman high-speed test track. Photo shows Lt. Col. John F. Stapp in recent record breaking 431 mph sled run, using an 8,000-ft. test track. Tests at higher speeds with 12 sleds are planned.

## Sleds Fill Major Gap in Air Research

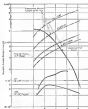
Construction of a new rocket-propelled test sled installation to be used by the Air Research and Development Command for testing various types and sizes of aircraft highlights the increasing role of the high-speed track as a primary research facility.

About a year from now, ARDC will begin testing on the new 52-million-horsepower, rocketing sled installation located on the edge of a 1,500-ft.-high mesa in Utah. Sleds and capsules will parachute down to the foot of the mesa (Aviation Week July 13, p. 15). The new track will be the fourth for the Command; others are installed at Holloman Air Development Center, where Lt. Col. John F. Stapp recently established an earthbound speed record of 431 mph, for various sleds, and at the Air Force Flight Test Center, Edwards AFB, Calif. (Aviation Week Sept. 7, 1953, p. 30).

Why a Track-Why is a track installation? What are the advantages and disadvantages? Is it competitive with other kinds of test facilities?

The answers to these kinds of questions have been given by Gerhard Elzer, scientist at Holloman Air Development Center and a strong proponent of track testing. In a recent symposium on high speed track techniques held at HADC, Elzer presented his views on the basic philosophy of such facilities.

Elzer said that the track does not compete with a windmill, but has its own merit and can fill existing gaps in aerodynamic testing. The time to use a track, he said, is when the windmill does not provide reliable results because



GRAPH indicates how results of ground run may be applied to supersonic flight.

of the lack of proper test conditions. He suggested that the role and value of a track would be found for large-scale models at Mach numbers above 2.5.

High-speed Railroad-Still further, a test track is simply a high-speed railroad. Sleds are measured on ground accuracy pads or ballast to steel beams set in concrete; the construction is massive because the track must be straight and level to sustain enormous acceleration from beams.

The vehicles which ride on the rails are more and varied, some of them are self-propelled, some need a pusher sled in addition to the sled containing the test installation. The term "sled" is

used because the vehicles are not wheeled, but ride on slippers of magnesium bearing on the steel rail.

Thrust for driving the sleds to super sonic speeds comes from rocket motor, single or in batteries. The sleds use either solid fuel rockets or liquid propellants, but the trend is definitely toward the use of liquid fuels.

Deceleration of the sled and test vehicle is done with a water brake. Between the rails of the track is a long shallow trench filled with water at varying depths, controlled by a series of hydraulic rams. A brake section—usually a shaped scoop—projects beneath the test vehicle and, as the rail of the run is reached, the scoop picks up water.

By varying the water through curved vanes, the sled gets up its energy to the water, and thus decelerates.

Three Ways—Elzer pointed out that of all the existing methods of aerodynamic testing, three appear to be even relative in providing the data required for engineering design: a windmill, free flight and captive flight tests.

But the modern windmill has become a huge installation, with enormous power consumption, and the complexities of cooling and drive. For example, windtunnels with installed horsepower ratings of 200,000 are already in operation, and studies consideration has been given to installations using 1 million hp and more.

Elzer says there is a limit beyond which it is more practical to move the object through the air instead of moving the air past the object, and he believes that the time has come to reconsider

the methods used in data gathering. Captive flight testing goes to the basic variables—parameters of Reynolds, Mach, Prandtl and Péclet numbers. The geometric side of the model can be more easily changed than it can in a tunnel test, should there be any Reynolds number velocity associated with change of flow in the boundary layer.

Track Drawbacks—One objection to track testing has been speed control. With present control systems, the sled—and therefore the equilibrium speed of the sled—can be held within pretty close limits. If for any reason sleds must be taken at a given acceleration, it should be possible to adjust the data gathering instrumentation with an accelerometer.

Another objection has been vibration of the models on the sled. Magnitude of the vibrations is not well known, and so far there has been little effort made to install vibration dampers in test sleds. But this is considered to be a problem that can be solved with existing knowledge, and is certainly no more difficult than the vibration of models in windtunnels.

Air Density Effect—The high density of the ambient atmosphere is an aid in establishing model similarity to full-scale conditions. At Holloman, for example, the track altitude is 5,000 ft. and the ratio of local density to that of sea level standard is about 0.85. In contrast, the density ratio between 40,000 ft., where the full-scale airplane may fly, and sea level density is about 0.15.

Therefore wind tunnels, operating at a density of about three times that of the full-scale conditions, can reach full-scale Reynolds numbers because of the high density ratio. Further, the solid test model will produce control forces and moments which are more nearly representative of intended full-scale values.

Elzer cited one comparison between full-scale and model tests. A 5-ft. model on the track has the same Reynolds number as a 20-ft. model at 40,000 ft. altitude.

Speeds on the track are not limited either. The Holloman high-speed track has already operated at a Mach number of 2.5, and is expected to go to 3.5 if you could maintain a 90° accident time and deceleration to a 500,000-ft.-long track, a test Mach number of 5.0 could be achieved for about 30 seconds.

How Flexible?—Three factors define the practical value of model test facilities.

- Initial cost for the installation of the facility.
  - Operational and maintenance costs.
  - Reliability and usefulness of test data.
- Cost per part of data is determined by the test time factor; this is a factor for the comparison of the efficiency of modern windtunnels but not



STATION—Lifted sled is stopped into seat for high-speed sled run.



STAR—Lt. Col. Stapp awaits call to start first test on Holloman sled.

particular figures for tunnels and tracks are non-existent, says Elzer.

Holloman experience has taught that 50,000 ft. of track could be installed for about \$5 million, or about \$400 per ft.

This does not check too well with the quoted figure of \$2 million for the new 12,000-ft. track at Utah, but the latter figure may include installation not considered in the original Holloman estimate.

Cost per run depends on the maximum speed of any run, in contrast to

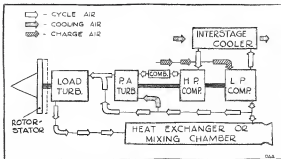
the windmill, where hourly test runs are usually constant. A saving will be achieved with the use of liquid-propellant models, which cost something on the order of one-half that of solidified propellant models. Elzer expects that the savings out of fuel for track testing will be five times magnitude at the cost of power for windmill testing.

Then he adds this controversial statement: "Due to more realistic test conditions, the usefulness and reliability of the track test data must be considered









LAGELBAUER'S PROPOSAL calls for a turbofan powered employing two-speed compression, a combustion system, and two turbines.

## Turbofan Aims at Higher Efficiencies

A turbofan powered built around highly refined, supercompressor using, rather higher operating temperatures is the answer to increased flight efficiency, says Ernst Lagelbauer, New York mechanical engineer. His proposal—initially a fan with transonic flow plus a partial admission turbine drive for two-speed compression—has been calculated by top government and university scientists in the country. There is some disagreement on details, but the general conclusion could be accomplished by this system, says a letter written by an official for the now-defunct Research and Development Board.

The general scheme proposed has improved the overall efficiency is used thermodynamically, and most of the details are already incorporated in Air Force developments of today.

But there is the general agreement exists, and in Lagelbauer's view, "If you want to start a good argument talk about air pressure gradients." On that point there is little argument, opinion ranges from the implications of the KJVS letter that some features of Lagelbauer's system are good enough to be incorporated in current designs, to flat statements denying value or its value.

### Lagelbauer's Engine

Let's have a look at his proposed powerplant scheme and see how the features, advantages and

disadvantages are. Briefly stated, the layout calls for a turbofan powerplant using two-speed compression, a combustion system and two turbines. One

turbine drives the compressor, and the other a turbine driven fan.

The thermodynamic cycle is considerably different from the conventional Lagelbauer suggests three degrees of refines.

• **CYCLE FLOW**, which goes through the complete cycle of compression, combustion and power extraction by the turbine.

• **EXHAUST FLOW**, which is separated from the cycle from the last stage of the low-pressure compressor and either mixed with the turbine exhaust or passed through a heat exchanger where it preheats fuel before the turbine exhaust.

• **COOLING AIR**, which is bled from the low-pressure compressor to cool the main turbine and is then passed out through the heat exchanger.

Proponents of the system device would vary with the particular application and the field engine, for example, as a language engine reaction, most of the air would be cycle air and only a small amount would be used as the by-pass air.

This basic cycle has been given the name of KJVS (KJVS KJVS) by its initials.

### Super Temperature

One principal feature of the KJVS is that Lagelbauer stipulates is the super-temperature dual (STDS) turbine system. Its three components are a single combustion chamber operating at near-Stoichiometric conditions and a set of four higher pressure than conventional in gas-turbine practice, and a single-stage partial-admission turbine which oper-

ates at 15,000 rpm. This also high-speed wheel drives the two-speed compressor. (Stoichiometric combustion defines a condition of theoretical proportions for burning fuel in air with no excess of either, for air and a hydrocarbon fuel the compression is a factor of about 1.6.)

For first level of compression, turbine and combustion processes take place with excess air, which leaves the exhaust temperature at 1,500°K. The gas pressure ratio is 1.6 for the primary system; in effect, only a portion of the turbine section will be subjected to the hot blast of the super-temperature gas while the rest of the turbine will be getting the relatively cool (1,000°K) air bled from the lower pressure compressor.

While the cooling air passes through the turbine, it cools enough to be used as a cooling medium for the fuel, and it cools the turbine to qualify as an additional working substance for the fuel turbine, it cools with the products of combustion downstream of the turbine.

One refinement of the powerplant design, although brought at the price of some compression of turbine components, could be applying the partial-admission principle to

# FLY WEATHER-WISE



These weather items prepared in consultation with the United States Weather Bureau

Rain drops from heavy clouds which fall from clouds often do not cool a body enough to cause rain to fall. Avoid heavy showers whenever possible.



Unlike showers, rain falling from stratified cloud layers may be warmer than the air through which it falls. Be prepared for poor visibility in the cold air just above the ground, or fog in lakes.



To avoid turbulence along flight lines, plan your way through the northern quarter of an active low. Although turbulence conditions are not as severe as they may be encountered, the severe weather will be avoided.



Even though stations report good weather—conditions in between are sometimes by-passed. You may be unable to maintain visual contact. Check all available information on so much weather as well as your normal weather.

## Best Pair to Get You There

STRIKING CLEAR of sunny weather can add miles to your mileage. Weather-wise pilots safeguard themselves with an extra margin of safety. They make their way with Mobilgas Aircraft power engine performance with Mobilgas Aero. These famous products are the result of 38 years of research and experience—experience with aviation since the Wright Brothers' first flight. Why accept less for your plane?



MOBILGAS AERO, INC. 1001 10th AVENUE, MINNEAPOLIS, MINN. PETROLEUM CO. OFFICIAL PETROLEUM CO.







## LETTERS

### What's Old?

Jack McKee takes me over the rails (Aviation Week, June 21) in a manner that I consider quite unbecomingly, surely for calling his "new" Super Dart a 1936 airplane. In spite of the fact that all new aircraft went into that dog, which was completed in 1935, the fact remains, and Mr. McKee admits it, that it is essentially a Dugger Dart, which is still a 1936 design in spite of subsequent modifications. This brings up a question of criteria for the many owners of "restored" aircraft and

craft that are second dogs.—What determines the age of an airplane? Is it the calendar date on the original blueprint, or the age of the raw materials that make up the aircraft? Examples are numerous.

The old 1935 300 Ford 40 engines made such good designs that many operators would claim them both new again to the point where few of the original components are left. Are these still 1935 designs, or are they "modern" because they have new components and most of the hardware is of recent construction?

What about the two Jensen that have

been built since the war, one of which was dedicated recently to American Wars? These days have new wood in the wings, metal tube landing gear, and modern power plants. Are they still Caters (N-4), vintage 1915, or are they now "Caters lightens, 1940 model"?

My husband's reasoning leaves me in a quandary over what to call my own "new" ship. I am putting the finishing touches on a DeHavilland 6000, which just so happens to be demonstrated at the forthcoming national soaring championships. While this ship carries a 1919 wing and tail of construction, the design around it is a typical one to be built in June 1936. I have made a few changes in the amount of improved performance, but I will feel that this is a 1936 design and not a "rest" one. I shall continue to apply the same reasoning to Mr. McKee's Dart.

FRANK M. BOWERS  
7403 Weyburn North  
Seattle 5, Wash.

### Tucson Maligned

I know you have with pride at your classrooms and academy, but in your reporting of progress here in Tucson you've been awfully short and snide.

The latest transposition appears on page 15 of your June 21 number wherein you state, "the Hughes plant is adjacent to sprawling Davis-Monthan Air Force Base."

The Hughes plant is adjacent to Tucson Municipal Airport, the only civil airport in the United States sporting a 12,000-foot runway (Davis-Monthan 24-27, here, 11,500 feet) and with sufficient area to be able to sell Hughes four airbases at least (Tucson Airport Authority controls just about the two thousand acres at this writing) and still have enough acreage left to accommodate all of the aircraft plants in northern California. To this end, Douglas Aircraft took area and moved in June 15. Others will follow.

R. W. F. SCHNEIDER, Manager  
Tucson Airport Authority  
Tucson, Ariz.

### Veritherm Accuracy

Thanks for writing up the Veritherm to-type temperature tester (June 25 p. 77). Even its accuracy stated, however, shows our accuracy at this design. It is clearly designed to thirty degrees a good enough to be believed, but not enough to kill in a test.

G. F. KILG  
North Park  
Toronto, Canada

[We are glad to achieve the dropped decimal point Veritherm's accuracy: ± 1.0°C—Ed.]

### Praise

I would like to express my warm thanks for the fine article George Christian wrote about Billie Archer, Sr., in the July 1 Aviation Week. I am most grateful for your consideration of our company. We would like 100 operators and 15 additional copies of the issue.

W. R. BAYNE, President  
Rafale Aircraft, Inc.  
Shaw, N. H.

**Douglas DC-7—America's newest  
and fastest commercial transport  
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The new *Learstar* is the only production twin-engine, transport-category airplane that can cruise at over 500 mph TAS at 10,000 feet, the only one that can fly 3200 miles nonstop, the only one that can cruise at 270 mph TAS using only 100 gallons of fuel per hour, and continue at this rate for more than 10 hours. In addition, the *Learstar* offers 2000 feet per minute rate of climb, exceptional single-engine performance, and the ability to operate with ease from pocket-size, grass-runway airports. The *Learstar's* spectacular performance is matched by the scientifically planned *Learstar* cabin interiors, researched and developed during many years of experimentation under actual conditions of executive travel.

These luxurious interiors, accommodating up to ten passengers, make for higher aircraft utilization, because *Learstar* passengers fly more hours without fatigue. *Learstar* executive airplanes are built to FAA-specified niche standards and are designed for flight qualification under the identical FAA "4b" specifications required of such modern airliners as 70-7's and Super Constellations. *Learstars* are the only airplanes designed specifically for executive use that are built to qualify in this category. . . For complete information, including performance curves, direct inquiry on your company letterhead to Lear, Inc., Aircraft Service Division, Santa Monica Airport, Santa Monica, California.

# LEARSTAR

A member of the Learjet Aircraft Division

YEARS AHEAD IN PERFORMANCE



## Hawker Speeds Hunters For NATO



1. **SUPERPRIORITY HUNTER**, which is to be one of NATO's mainstays in the air, is being produced at United Kingdom factories; it is also being built in Holland and Belgium.



2. **FUSelage SECTION** like other components is built in one place and sent long distances away, etc. When components come together for final assembly, it is relatively easy to compare drawings, being wrong.



3. **SWIFT WINGS** are built up on sublet steel girders. Hawker has produced an aerial Hawker fighter. Recent Hawker orders will be placed in an RAF order to complete.



3. **TIME-FINISHED** Hawker on production line at Hawker Siddeley plant wait for other parts to join them.



5. **COMPLETED FUSelage** sections are loaded at Blackpool preparatory to transport to final job. In addition to Soviet NATO member Hawker recently placed order for Hawker.

## PRODUCTION BRIEFING

• **Boeing Airplane Co.** plans to send lawyers to begin trademarking 700-500 production low cost workers to Lancia M.R. Work, for checking out Boeing B-12 production jet engines prior to delivery to Soviet Air Command. USAF will build a design, flight space and operations building at the base.

• **Cowdery Corp.** has been organized in Buffalo, N. Y., to design, develop and manufacture simplified, low-cost training aids such as procedural trainers, mounted panels, displays, memory components and integrated transport control. Founder is E. O. Cowdery, a pioneer in qualitative trainers, formerly with Stanley Airborne Corp., Buffalo, and prior to that with Link Aviation, Inc., Binghamton, N. Y. The firm plans to work on new type trainers for classified weapons.

• **American Rocket Co.** has been formed in Wyandotte, Mich., to handle development, construction, development, production and testing of rocket and jet devices. Present operations deal mainly with research on propellants, but rocket guidance and control are also under consideration.

### BuAer Contracts

The following contract awards of \$25,000 and more have been announced recently by the Bureau of Aeronautics, Department of the Navy, Washington 25, D. C.

**BUFFALO MEMORIAL INSTITUTE**, Columbus, Ohio, contract research and study of chemical reactions, properties of metals and alloys. \$15,000.

**J. B. McALLISTER & CO.**, Inc., Indianapolis, Indiana, contract research and development. \$25,000.

**G. R. KENNEDY AND ASSOCIATES INC.**, Philadelphia, contract research. \$15,000.

**SPARTAN CRACKING CORP.**, Chicago, Illinois, contract research and development. \$25,000.

**AMERICAN AIRCRAFT CORP.**, Dallas, Texas, contract research and development. \$25,000.

**GENERAL ELECTRIC CO.**, Schenectady, N. Y., contract research and development. \$25,000.

**SPARTAN CRACKING CORP.**, Chicago, Illinois, contract research and development. \$25,000.

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**SPARTAN CRACKING CORP.**, Chicago, Illinois, contract research and development. \$25,000.

(Continued)

## Valve Talk

for Wm. B. WHITTAKER CO., Ltd.

for Marvin Miles

Senior Member, American Writers Assn.



The news announcement was short and to the point—

It told merely that the Wm. B. Whitaker Co., Ltd. had purchased the Solvay Engineering Co., producers of gyro and servo mechanisms (that E. B. Meyer was named president of the new organization; that Nevil Solvay, outstanding geophysical instrument design engineer, was elected executive vice-president).

The acquisition introduces Whitaker Ingenuity and organization into an entirely new field for the aircraft gyro compass, and the story behind it stretches back twenty-three years to the cradle of the California Institute of Technology.

Bob Whitaker and Nevil Solvay attached their Civil Tech and Civil Engineering and became close friends. Solvay was destined for engineering, for he was a child who grew up as an undergraduate in the slow-moving post-war period. But he had a job in a high superconducting for Condenser side. Solvay went to work for Sturges as a stress analyst.

But Solvay, Solvay pushed his engineering study into aerodynamics and came up with a new air speed indicator design that compensated for altitude and temperature.

He discussed it with Bob, and Whitaker quickly saw the prize within. The two men quit their jobs, joined forces and established a key shop in a garage.

They had formed the pair, Don McLennan—now executive vice president of Whitaker Ltd. and then production manager for Eastern Products—also became interested in the new speed indicator and joined the group early in developing the instrument for military use.

As late as 1941 Bob left to establish the Wm. B. Whitaker Co., Ltd. and associated civil rights. Don stayed with Solvay long enough to develop a vacuum regulator and an electronic and bank indicator which Solvay Engineering and manufacturing.

It was clear design and production of a complete Whitaker's suspension, and the company was growing rapidly. It was clear that there would be little change in the staff of 700.

Because for Solvay products will be handled by Whitaker's, the main field engineering office, and both J. B. Meyer (Whittaker vice-president) and Nevil Solvay (Whittaker vice-president) were in the company's early days.

For thirteen, three friends will be working together again in a working environment different from a traditional work group.





1. J65 STATOR BLADES fit in ground under wings on engine's compressor housing



2. SHUGGLED IN WELLS, J65s are moved in lowest to convenient working height



3. AT END OF LINE, engines get finishing touches at Cates-Wright's Wood Ridge plant. The J65 powers the Lockheed XF-104 and five other military aircraft

## Views Along Wright's J65 Line

In high performance military aircraft types are getting the J6501s thrust J65 powerplant, shown in mass production in these photos taken at Cates-Wright's Wright Aeronautical Division.

The J65 is specified for USAF's new Lockheed XF-104 lightweight fighter, Martin B-57 lightweight bomber, Republic F-54C lightweight fighter and Navy's Douglas A-1H Intruder bomber and North American F-5 combat fighter.

In addition, the J65 has been selected for other military groups of classified nature, Wright says.

The company expects that all of its production J65s have exceeded the engine's guaranteed thrust rating and that fuel consumption in the field is as much as 8% under the guarantee figure. This lower fuel appetite is translated into longer range, the company notes.

The J65 is also being built in Brazil, under license from Cates-Wright.



4. INTO CANS for shipment they go, after test to guarantee 7,220 lb. thrust

## JUST A MATTER OF CONTROL

### LORD ENGINEERING CONTROLS VIBRATION

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To minimize the damaging effects of vibration and shock is ... just a matter of control. Here at Lord the research engineer, chemist, metallurgist, designing engineer and craftsman work as a team to meet the conditions under which the use of Lord Vibration Control Mountings improves product performance. Our 30 years of technical "know-how" is concentrated on your vibration and shock control requirement ... and Lord Precision Manufacture results in mountings and bonded-rubber parts which not only improve performance but also reduce the operating and maintenance costs of your product. This helps you to increase sales. We welcome your inquiries.



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## Weapon System Concept Poses Challenge

• New philosophy aims at well-integrated designs, but presents the possibility of too-early 'freezing.'

By Philip Klein

**Design**—The system and electronics industries now collaborate more closely to meet one of the greatest challenges to the current "weapon system" philosophy: how to obtain a well-integrated system, yet assure that it incorporates the latest electronic technology of military importance.

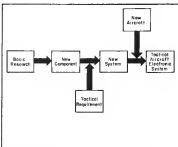
This challenge was expressed by General Electric's H. B. Oldfield, Jr., in a paper read by Bernard Radwin, at the recent Device Conference on airborne electronics. Oldfield, former manager of GE's advanced electronics center, presently heads its advanced tube development study group. During the war, he was the AF's liaison representative on airborne fire control at Massachusetts Institute of Technology's Radiation Lab.

► **World War II Philosophy**—During the last war, the greater part of all new weapons equipment consisted of standard base components research. New and dramatic roles for weapons, spurred by new tactical requirements, grew directly out of the development of such new components as pulse magnetrons, TWTs and ATR tubes, and basically new antenna techniques, Oldfield said.

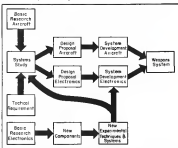
Properly, a new weapon system was evolved, tested as a non-tactical aircraft, and immediately ordered into production. "Then came the danger and confusion because of making the two (equipment and tactical support) into a single weapon," Oldfield said.

"Where the priority was just average, the making was often uncoordinated. Where the priority was sufficiently high, and by using planes P-51 or bomber design and maintenance men, it was possible to perform new miracles in introducing new techniques into the field within months, or even days, after the actual need arose," Oldfield noted.

► **Technique Over System**—Despite the many resulting headaches, Oldfield pointed to several examples in which the application of the same techniques paid off despite lack of what would be called sound system planning: battle of the Buna banks, breaking of German submarine campaign, defense of Anne beachhead, radar bombing of Japan, invasion of Normandy.



WORLD WAR II system of making new weapons driven and aircraft often failed.



WEAPON SYSTEM concept characterizes "pitchfork," but requires close cooperation.

For example, the introduction of airborne microwave (3 cm.) radar enabled the Allied air forces to track down German U-boats. The German navy was completely confounded as to the means of submarine detection and thus

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GE TECHNICIANS checking their latest controlled 647 gyro type clear avionics manufacturer's latest required for complex weapon systems.

gues and an accuracy." O'Grady acknowledged Avionics for this as the increased complexity of aerial warfare and the high speeds involved.

"We must create a weapon system tailored to the specific tactical application which the military requires." This has shaped the ground rules under which the avionics industry and its designers operate.

Today, the conception of a new system begins with the system study phase in "almost exclusively broad-based among avionics equipment so that which can be produced in the reasonably near future," rather than on the development of new electronic components, O'Grady said.

Planning is parallel with the weapons system development program is the second sequence of electronic research and development, proceeding from basic research to new experimental devices aimed at making solid advances in the state of the art.

■ **Early Focus**—"In the weapons system concept phase they appear to be a rather early focusing of those significant philosophy," O'Grady noted. "This means the system design will not be as sophisticated as it might be if the fruits of new avionics developments could be incorporated later in the aircraft development cycle."

O'Grady believed that solution to the problem involves both the avionics and the aircraft manufacturer.

■ **Avionics industry must accept and understand the requirement for integrating its equipment as just another part of the weapon system.** O'Grady believes the industry has been up to this task and is beginning to fit into the system. GE, for example, has acquired its own electronic lab to concentrate on system research and development.

■ **Aircraft industry must bear in mind, during its complex, long-term systems integration program, that some major or minor technological breakthrough in the avionics industry, possibly a revolutionary new component, may completely obsolete the carefully integrated avionics portion of the weapon system.**

The long-range solution to this problem

## Science of Avionics

Avionics involves electronic systems become a "distinct science or branch of engineering" because of the new and different technical problems which it presents. B. R. O'Grady, Jr., Ground Electronic Electronics Division, told the recent Dayton conference on avionics electronics.

"The environmental loads subject to aircraft resulted in a complete change of conditions of operation," O'Grady said, because of such things as vibration, pressure, parasitic heat, extreme time pressures, and stringent space and weight limitations.

low can come only through a considerably closer coupling between the two industries in the research and development phase," O'Grady said.

Burt said earlier "that other party away logically be the dominant member of the team, depending upon the nature of the problem."

## New Fast-Acting Gyro Made for Missiles

A new two-axis fast-acting gyro, which reportedly can accelerate to operational control speeds within 10 seconds, an important advantage in guided missile applications, has been announced by Sperry Gyro Corp. The new homogeneously etched Model 223 is currently used in a supersonic ground-to-air missile and will be used in an air-to-air missile, according to the manufacturer.

The new Sperry gyro can be powered by 25 v. d.c. at 115 v. 600 cps, single or three-phase current. Unit has a maximum reported drift rate of 8.1 deg./hr. and can be furnished with either pot or synchro pick-offs. Gyro can be electrically caged from normal displacements within four seconds, at a maximum of 20 seconds if displaced full 180 degrees. Resonant frequency is 144,000 cps.

Model 223 weighs 40 lb., measures approximately 3 1/2 in. dia. x 5 in. long. Company address is 2525 Broadway, Santa Monica, Calif.

## Avionic Literature

New technical bulletins and booklets describing devices and techniques at present in process in the avionics field include:

- **Avionics Systems** paper, 70th Institute describing operational and technical features of the 1964-65 and 1966-67 avionics systems. Avionics Dept. RCA Communications Company, 1000 N. 17th St., Ft. Worth, Texas 76101. Order form on back. Price \$1.00.
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## FILTER CENTER

■ **Collins Mag Amp Gyro**—Prototype models of Collins Radio's new MG-60 gyrocompass, which substitutes magnetic amplifiers for all but one of the normally used electron tubes, will be available for test within a couple months. New gyrocompass, designed to provide heading signals for the Collins Integrated Flight System, should be available in production quantities within a year, company spokesmen say.

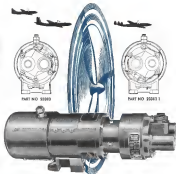
■ **Bigge Weston Expanded**—More than 500 exhibit booths have reportedly been reserved for the 1974 Western Electronics Show and Convention, Aug. 18-22, in Las Angeles, compared to 370 for last year's. Weston, More than 100 sales and service are scheduled to be given during 20 technical sessions.

■ **Setting the Record Straight**—An article written May 17 article on 3-D radar display, based on a paper by a Sperry Gyro engineer, has prompted K. L. Durrant to call on attention to similar work reported in the March 1968 issue of the RCA Review. That and other historical references cited by Sperry's Walker B. Tower in his original paper, were omitted from Avionics Week's article in the interest of brevity. Despite RCA's early work, Sperry claims to its claim of being the first to patent 3-D radar display, with its general application filed back in 1943.



## Ground-Based DC-6B

What appears to be a DC-6B cockpit is actually a Curtis-Wright Delco DC-6B flight simulator, recently ordered by Sikorsky for use in training its Sikorsky Helicopters, New York. Simulators cost \$100,000, but are expected to pay off by reducing training expenses.



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TROUBLE-FREE PERFORMANCE

"as specified"

BATED CAPACITY: 3.75 GPM. min. at 20 VPS 6.0 and 170 AMPS

MAX. FLOWING: 105 ± 25 P.S.I.

DESIGN VOLUME SETTING: 1400 P.S.I. min. with outlet port blocked

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FLUID: Various aircraft oils and lubricants, such as aircraft oil

Aviation Week's article on 3-D radar display, with its general application filed back in 1943.

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## EQUIPMENT

### New Fuel Unit Boosts Jet Performance

• Parker's variable-area fuel nozzle helps improve combustion efficiency and give faster starts.

By George L. Christian

Cleveland—A new jet engine fuel nozzle, in production here at Parker Appliance Co., may increase the range of jet aircraft and reduce the time needed for "start-ups," company engineers say.

This is made possible by the use of the variable-area principle—first time this has been applied successfully in a jet fuel nozzle. Parker says—its special valve, which boosts combustion efficiency.

The new nozzle shows great promise for turbojet engines used in aerospace and very-high-altitude aircraft; and because all of its functional parts are contained within an envelope of one half inch, it should be useful in space-oriented power applications.

It is especially adaptable for use with the new type aircraft fuels, according to company engineers.

► **New Jet**—Parker says the nozzle is being tested and considered by most of the major jet engine manufacturers, and is giving excellent fuel performance in turbojet, high-power engine. It is the result of an intensive, three-year research and development program carried on by the Engine Advisory Division of Parker.

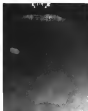
J. F. Campbell, who is acting in the capacity of consulting engineer for the nozzle program, holds basic patents for the device.

► **Better Atomization**—The specially designed valve opens fuel at a considerably higher rate by a much lower fuel flow than through its outlet. Result is much better jet atomization. This gives a considerable increase in combustion efficiency—an important consideration in helping the turbine engine designers bring the jet's specific fuel consumption closer to that of a piston engine.

The mechanical valving system, which is built integrally within the nozzle, provides positive closing at the "end of the burn," i.e., at the moment which the fuel burner is shut off. The fuel system from the tank. When the engine fuel supply flow tank is under is kept full at all times, and the pilot's engine may be started in the shortest possible time—an important considera-



VARIABLE-AREA NOZZLE shown here has 18.1 micron-orifice-orifice flow ratio.



SPRAY PATTERN, variable-area nozzle (left) and high-quality duplex nozzle.

tion in the event of a "variable."

(In conventional systems, the nozzle are "open" and fuel nozzles are only partially full. This means air is vented along them before sufficient fuel reaches the nozzle to support combustion.)

Another important result is that the integral valving action allows fuel flow to stop quickly and easily from main tank to maintain tank but a single line, eliminating the dual line and cumbersome, weighty plumbing, previously required to handle the large fuel flow variation.

Furthermore, the positive valving

action seals the fuel within the nozzle and prevents it from leaking into the combustion chamber, eliminating occasional "hot spots" starts caused by squirts of fuel in the chamber.

► **Test Results**—Parker cites these improvements which were noted during six level tests conducted with a production engine incorporating the new nozzle:

"More positive fuel-ups . . . with an extremely lower minimum fuel flow . . . Time from 'burnt-out condition' to 'hard' average 0.15 sec. . . Engine always fired the instant the fuel supply was



...designed and built by Boeing

...air-conditioned by Stratos

The successful first flight of the Boeing 707 jet transport marks an important milestone in the progress of commercial aviation. Engines and fuel-fed jet transport, the 707 is also designed to serve the Armed Forces as a jet tanker capable of matching speed and altitude with modern military aircraft.



AIR CYCLE REFRIGERATION EXHAUSTS HOT AIR FROM CABIN

It is pioneering spirit like that shown by Boeing that has enabled the U. S. to gain and hold world leadership in the Air. Stratos is proud to have worked with Boeing on the Stratosher-Stratosher and to have designed and produced the air conditioning system for America's first jet transport.



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AIR MOTIVE UNIT USED IN BOEING 707



also needed for remote engine operation. Fuel flow at this time is 500 cc/sec, 515 lb/hr. Running start procedure did not need to be too carefully followed to assure positive fuel flow.

These engine-warm-up problems were solved by the remote maintenance fuel fuel manifold at all times and by making good connections at very low fuel flow, fuel flow rates.

Based on experience, the optimum fuel flow and 500 lb/hr lower temperature, when the fuel engine was used. It was evident that a considerable gain could have been made by modification of the power distribution programming, Parker points out.

•Higher and Lower-These benefits were noted as flowing from the better fuel distribution control by the Parker main computer with that in a stand-alone mode.

•Lower starting engine time. As engine starting time is considerably less than that required with a conventional engine. The engine does not power itself from the main computer, but is started at about 200 psi, but it does produce power enough to sustain the starter until the engine becomes self-supporting at one-third ground idle rpm. One result is less wear on the starter, prolonging its life. Draw on the starter's battery is reduced, increasing battery performance.

•Better kick-off starting characteristics. Engines equipped with the Parker remote start more quickly at altitude because the remote fuel engine will fire up engines at much lower fuel flow and lower starting rpm, thus is normally required.

•Wide Flow Range-This new engine can handle wide ranges of fuel flow without corresponding large variations in fuel pressure, say Parker engineers. That is particularly noteworthy in the high fuel flow ranges, where the remote will pass as much as 5,400 lb/hr at 600 psi.

How are sample flows, with corresponding pressures:

- 1570 lb/hr at 60 psi, maximum flow for starting.
- 108 lb/hr at 15 psi, for cruise conditions.
- 1,500 lb/hr at 250 psi, for climb and high-power operation.
- 5,400 lb/hr at 400 psi, for takeoff.

When the highest pressure needed is 400 psi, and this only at takeoff. During the rest of the flight, pressures of 250 psi, and lower are all that are required. This should be a considerable improvement when you face the problem of making pumps that deliver not only increasing quantities of fuel, but at higher and higher pressures.

These relatively low pressures at high fuel flow are achieved by automatic fuel

modulated increases in the remote's outgoing pump pressure to maintain a relatively constant output level.

A similar result is in development, with a flow range of 9,450 lb/hr, with a pressure range of 50 to 200 psi. •Remotely-This remote is a part of the remote's positive output system in the fact that it does not open until sufficient pressure (34.65 psi with JP-4 fuel) has been built up in the fuel manifold to assure good and steady flow. This action ensures quick starting.

The variable-flow remote is designed that a relatively high value of fuel energy and cut-off velocity is maintained always to assure satisfactory atomization, Parker says.

The remote's positive output characteristics need for combustion chamber flame characteristics and associated values.

•Wide Viscosity Range-This remote is also capable of handling fuel under wide viscosity ranges. Parker says that a viscosity variation of from 0.5 to 2.0 centistokes will have a negligible effect on the fuel's atomization. Put another way: At a constant pressure drop, the fuel flow will change approximately 0.25% for this viscosity change.

Pressure potentials and open velocities are established at a value which gives excellent atomization for fuels of 20 centistokes viscosity, and even other fuels as specified. Twenty centistokes was selected because it is the approximate viscosity of JP-4 at a temperature of -65°F.

Parker officials say that remote operation will not be such a major viscosity-flow-atomization problem through jet engine lubrication oil.



F-102 Fire Detector

The first part of the internal structure of General's super-sensitive fire detector, the F-102, shows the Thomas A. Edison continuous type, setting the detector threshold level on a scale of fireproof. Two outlets of engine thrust are tested in place above and below a position of the detector.

•Uniformity and Viscosity-Parker notes these examples of the remote's uniformity of performance and variety of potential application.

•Uniformity The remote is designed to assure an obtaining highly uniform fuel flow (and therefore highly uniform engine performance) from fuel flow from one burner to the next. The temperature spread between maximum and minimum burner outlet temperature range was reduced from 125 to 45°F by using the remote's uniformity in tests on one production-type jet engine.

The use is also designed and engineered to achieve a ±1% matching of fuel flow for a given pressure.

Parker adds that constant gas temperatures are 5.5% lower for a given open and corrected specific fuel consumption. This indicates that a lower specific fuel consumption can be obtained by proper adjustment of the variable remote.

•Viscosity, Parker engineers say the remote is built so that the fuel will flow right around the cut-off valve and around downstream nozzles. This makes it possible to obtain a wide range of spray angles, shapes and sizes. Also, the spray angle can be varied to meet almost any desired program of dual engine fuel flow by using the remote's built-in fuel flow regulation and thrust penetration, length of the combustion chamber can be cut out internally, resulting in a corresponding reduction in engine length and thrust and weight and space savings, the company says.

Parker officials state that to obtain the ultimate efficiency out of the variable remote, the combustion chamber length must be altered to take advantage of the wide range of atomization, spray angle, spray shape, spray penetration, etc., available with this remote.

•Parker Fluidity-Regon engineers note findings of Parker engineers with the remote.

•Lower specific fuel consumption has been proved, an operational experience with the remote. In one case a 2.5% reduction was obtained with the variable remote using JP-4 fuel over a standard remote using aviation gasoline. With the standard remote, the specific fuel consumption was 1.0% higher with JP-4 than with aviation gas.

In another test using JP-4 fuel, the specific fuel consumption under 18,000 lb. conditions was 5.7% less with the variable remote. This can have an important impact on increasing jet range.

•Fuel-air ratio, using JP-4 fuel is considerably reduced at takeoff power.

•Wider margin between idle operation and first cut-off is offered by the remote.

•Nozzle, including body, is a complete functional unit and does not depend upon servicing as a burner. This al-

lows the remote to be installed in equipment at the engine manufacturer's assembly line for such designs where "burner" type fuel systems are used.

•Outside shape and size of the remote body can be furnished according to jet engine manufacturer's design requirements.

•Air delivery can be of improved design since they are largely made of an integral part of the nozzle or nozzle holder structure.

•Reliability-Parker engineers say the reliability of their multiburner fuel remote "is directly related to its ability to maintain its original characteristics under the most severe conditions imposed by the customer. These remote units have been tested in those conditions in production MIL-E-1600."

One of the distinctive features of the remote which permits the unit to operate with light lubrication is a special spring which works with the valve. The spring is machined from chrome stainless steel with considerable precision and its rate (in lb/in) is scale tested within ±1%. The spring cannot cut with the result that "it will eliminate any leakage from unbalanced forces imposed on the moving parts," Parker says.

•About the Company-Parker recently transferred all engineering and sales personnel for aerospace products from Cleveland to a new plant in Los Angeles International Airport. Most manufacturing has moved there too, eventually, all aerospace products manufacturing will move to the West Coast.

Aircraft engine accessory engineer



Giant Stand

New USAF hydraulic lift-and-rotate system was tested today at Boeing Aerospace Co., Seattle, next to the incoming tail of an eight-74 Boeing B-52 Stratofortress. The one stand now is estimated 45 ft, and the first test of the type of the B-52's tail.

ing, manufacturing and dreams also will occur in Cleveland.

Parker started doing business in October 1955, as a sole proprietorship. The company was incorporated in Parker Aerospace Co. in 1958.

Total sales volume is divided 60% for aircraft products, 40% for industrial components. The company now works with all major jet engine manufacturers in the country, with its primary interests in the fields of fuel, hot air and hydraulic applications.

Parker has 405,000 sq. ft. of manufacturing and office space here in Cleveland. Other plants are in Los Angeles, Reno, Nev., and Exton, Ohio.

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WORKING WITH the editorial cooperation of the USAF Air Materiel Command, Aviation Week's editors are preparing their most important publishing assignment of the year . . . the August 16 Air Materiel Command Edition. Editorial offices at Wright-Patterson Air Force Base, Dayton, Ohio are busily working with activity as teams of Aviation Week editors collect the latest available information and data on 1955 Air Force Procurement and weave together the complete story of this major Air Force Command.

KEY EDITORIAL EFFORT is being concentrated on covering new policies and ground rules of AMC and its revised relations with the aircraft industry . . . spelling out new regulations and complete information on how to best do business with the government. Other editorial sections will be devoted to Air Force industrial mobilization plans, spare provisioning policy, and industry's new

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role in Maintenance and overhaul programs. Research and Development procurement will be featured in a special report.

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## OVERSEAS SPOTLIGHT

### No Captains Yet for KLM

AMSTERDAM—KLM Royal Dutch Airlines will not proceed to the sale of passenger balloons "until the two-engine Sikorsky is on the radar," probably by 1957, a company official has told Aviation Week.

The company wants present Western European passenger-carrying services to be "a successful public-aircraft," and feels single-engine planes are "too risky, too fragile, and highly susceptible." The

KLM official stated that even a twin-engine service would operate at a loss, considering the present state of high-captain development.

### Fiat F-86K Pact Signed

CONTRACT for assembling 50 F-86K fighters by Fiat in Italy has been signed at Washington. This gives effect to the general agreement signed in Washington in May 1953. Fiat was given a plant in Torino to handle the work.

The contract amounts to \$12.5 million, but the total order, inclusive of supplies in the U. S., will come to \$14.5

million. Italian industry will get about \$5 million of the \$12.5 million, with the remainder scheduled to be spent on the other side of the Atlantic for accessories, motors, radio, and other equipment.

Meanwhile, American Wings has learned, a U. S. commission visiting Italy is said to have learned that if the Italian government does not have aircraft built on its own account, no more offshore orders will be placed here. This type of aid is in supplement, not replace, the local effort, the commission is reported to have said.

### RAF Releases 50 C-47s

THE 50 C-47 Dauntless recently released by RAF (Aeronautical Warfare) July 19, p. 7) are scheduled for service with NATO air forces. They will be roomed at Great Britain at U. S. expense, then returned to the U. S. government for sale to the Western allies, says Flight magazine.

### Car-Ferry Airline Busy

Silver City Airways, British cross-channel operator, carried 39,461 vehicles and 96,055 passengers in 1953. International Civil Aviation Organization reports: With its 7-million capacity tonnage, Silver City ranked among the world's first 40 airlines, says RANA. The carrier operates four routes across the channel and one to the Isle of Wight, with an average stage length of 84 miles.

The first of three new Bristol Mark 12 fighters was delivered to the air force recently, joining six others already in ferry service. The Mark 12 holds three or 20 passengers.

Two additional companies recently entered the ferry carrying field. Air Lingua, the Irish airline, opened a Dublin-Birmingham service, and a Franco-Spanish company has been formed for Mediterranean service.

### El Al Tries for U. S. Loan

EL AL Israel Airlines is reported seeking a large loan for the purchase of new, modern aircraft. Negotiations between El Al and a leading U. S. bank are understood to be moving in a successful direction.

### U. S. Equipment Order

Two British firms have received a \$2.5-million order from the U. S. Air mobile ground power, never used for anything but the test. The stations are for the use of the Western Allies.

Shawing the order are Avia Dyna, Ltd., and Compcon Precision, Ltd.

## WHAT'S NEW

### Telling the Market

An eight-page bulletin No. 1020 on plug valve operation has been released by Leifco Mfg. Co., 1680 So. San Pedro St., Los Angeles 15. "Pressing and Bending Copper Alloys," a 272-page book prepared by Korten's Technical Writing Department may be obtained free of charge when requested on company letterhead, or the \$2.00 per personal letter. Address Technical Editor, Korten Aluminum & Chemical Sales Inc., 909 N. Michigan, Chicago 11. Fifty-page Bulletin 68D, published by Morgan Machine & Tool Works, contains latest information on the entire line of power-squaring shears. Company's 52-page Bulletin 69C introduces the complete, new line of press brakes. For order or leaflet write Morgan Machine & Tool Works, 603 Northland Ave., Buffalo 11, N. Y. The Slinky seat, holding transformer is the subject of Bulletin 121-33 issued by Slinky Bars, Inc., 4915 W. 47th St., Chicago 35.

T. W. and C. B. Sheridan Co. has prepared an eight-page leaflet on its dual-action, full-size and extension stretch-wrap learning machine. Requests on company letterhead should be sent to Sheridan at Pilot Vendors Estates, Child. . . New information manual is covered in Bulletin 28-50 of Scribner's and Co., 4201 S. Racine St., Chicago. Bulletin HY 554 is being distributed by Armstrong-Berry & Co. to announce the Hydrogrip, a new portable, single-arm hydraulic power unit for drilling or peeling pipes, wheels, bearings or parts. Company is located at 5146 Northwest Highway, Chicago 30.

### Publications Received

- A History of Hyg—by C. H. Gilchrist. Published by Farnham & Prosser, Inc., 101 W. 4th St., New York 14, N. Y., \$4.95, 304 pp. A history of man's fight for mastery of the air, starting from legendary times.
- Selected Condenser Problems, Treatise Materials and Associated Applications—The Advisory Group on Aeronautical Research and Development of NACA, published by Butterworths Publications Ltd., 85 Kingsway, London, W. C. 2, 54 pp. Report of Condenser Collection held at Cambridge University, England, Dec. 7-11, 1953.
- United Image Evaluation—U. S. Dept. of Commerce, National Bureau of Standards, Division 515—Info from Government Printing Office, Washington 25, D. C., \$2.25 (includes bound, 212 copies, 200 pp. Proceedings of the NBS Symposium on Image Evaluation in Optical Image Evaluation held Oct. 18-19, 1951).

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#### ACCIDENTAL CONSTRUCTION

A special light from Washington was directed into the House of Representatives in April 1966, when the House passed a bill to amend the National Labor Relations Act to require employers to bargain with unions representing their employees.

## LEARNING OBJECTIVES

Such abstracts are submitted by members and are published in abstracts volumes issued at a price of \$100.00 per volume. Some form of acknowledgment is provided, and abstracts themselves are automatically checked in as subject files in the abstracts volumes.

#### TECHNICAL REPRESENTATIVES

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(lies to value aircraft earnings at four or five times their current rate. This would sink a company that was expected to show annual earnings of about \$300 per share would find its common stock selling at around \$15 per share.

Today, as tendencies incline to value aircraft earnings at seven to eight times and even higher, the impact on market operations becomes self-evident. Price earnings ratios are rarely constant, they are influenced by general market pressure, investment climates and evolutionary changes of individual industry groups corresponding with one another.

The 1980 season that most stands together late gives their owners a happy time that has in 1956, although no comments in price appreciation at present. The table on page 39 shows a range at July 16, of 111 1/2% to 134 1/2% of price at the close of 1953.

★ **Star Performers**—Douglas is clearly the outstanding performer, having risen then doubled in price since early this year (\$80.50 vs. \$161.30). The company's claims were split two-for-one on May 2nd and the quotation of the stock stood at about the level of the old stock price at the split.

Bacur, which also effected a stock split earlier this year, lost little time in more than doubling its price (\$49 3/4 to \$74.00).

French, as it reached its post-1945 lows and improved its outlook, found eager supporters to bid its currency back to a new peak and almost double the price recorded at the 1952 year-end (\$10.13 to \$20.75).

• **Speculative Support**—The speculative elements boosting aircraft stock prices can be seen in the market behavior preceding the announcement that North American Aviation received a contract to develop and build a transport carrier for commercial use.

The company is solidly entrenched as the backbone of the backbone of the Air Force's fighter program. Moreover, its interest in atomic energy research development has been known for five years, according to prominent executives in its annual reports. Yet, this recent announcement of its atomic energy activity was greeted as something new by many stock buyers who rushed into the market pushing the price of North American's stock sharply.

In other words, this buying impetus stems from a burner which was passed for some time and which is unlikely to contribute much, if anything, to our *own* skin care.

The selectivity of price gains among the world group again again reverses the selectivity which has become pronounced in the industry. There will, therefore, be a more even distribution of price gains among the group.

— 600 —

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**BOMBING AIR STUNNED** standing in 707 (center model) covered thousands of designs including the Starfighter intended to have four turbojets (left) and, less potent jets (right)

## 707 Flight Test Log

While Boeing's big new 707 jet transport prototype responded to the panel for the installation of fuel and more test equipment, flight test engineers can look back at an intense program that began 15 to 46 days of this in the first eight days of May.

Here is a detailed breakdown of Boeing's tests up to July 12:

- Flight 1, July 15: one to 34 min. Program: Low- and medium-altitude takeoffs, general handling characteristics, lateral control with flap extension and standard approach take.
- Flight 2, July 17: two to 25 min. Program: Combination of low- and medium-altitude takeoffs, lateral control, operation of air-conditioning and windshield heating systems. Flare reached 22,500 ft and 455 mph, test ended.
- Flight 3, July 18: two to 39 min. Program: High-altitude takeoffs, system and control effectiveness. Flare

reached 42,000 ft, exceeded Mach 0.8 test speed.

• Flight 4, July 20: one to 49 min. Program: Alternate operation of components, manual extension of flaps, simulated "personal."

• Flight 5, July 21: one to 39 min. Program: Low-altitude turn.

• Flight 6, July 21: three to 55 min. Program: Full power climb to operational altitude for engine cooling and power data, initial level maneuvering, slow-down and landing of engines at operational altitudes, normal descent-6,000 to 6,000 ft—with airbrakes extended and full gear down to test tank entry; go-around; one with testing stopped

to simulate aircraft spin recovery system.

• Flight 7, July 21: three to 31 min. Program: Fuel shutoff, "cold soak" test at high altitude for engine-out function; go-around landing with the B-70 in simulated landing.

I think it was George Schaefer—called Tex (just prior to 34 Johnson)—low about the engines, and Tex said, 'Oh, they're fine. And that was the end of the conference.'

The outcome of flight test time rolled up in the first few days of flying, especially the 54-min. first flight (November, West July 25, p. 14). It brought into the cockpit of contemporary jet engines and the backlog of engineering and design understanding built up in the field of large jet aircraft.

► **Bomber Background**—Most of Boeing's jet experience has come from its development, construction and flight testing on the B-47 Stratojet and the B-57 Superbeast. But the company has not been afraid to seek that experience, where new tests or new data showed the way.

Despite more than 15,000 ft spent in the wilderness with models of the two bombers, Boeing received another 1,157 ft of total experience from plus about 510,000 worth of models in the 707. With a combined time for engine testing between 6000 and 51,000 psi hour for high-speed testing, the bill for these tests alone exceeded the million-dollar mark.

On its jet experience in building this flexible, highly stressed wing on the B-47, Boeing turned to a flyable structure for the 707 wing and tail thinner than.

"We have learned as we go along," says Schaefer. "The B-47 was the last of what we know, but there's a relatively old design. And we know a lot more now."

Another example is the evolution of the lateral control system on the B-47, which was a combination of all three on the new 707.

► **Around the Plane**—The close lines of the 707 make it tough to make an initial takeoff, the engine is pushed out to a great B-72. The 150 ft wingspan puts it somewhere between the B-47 (116 ft) and the C-97 (141 ft) in wingspan, overall length is 125 ft, longer than either B-47 or C-97. It stands 15 ft in the top of its folding vertical tail.

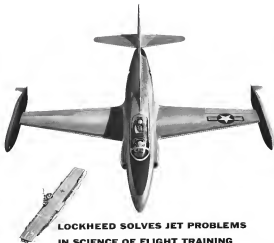
Corrected flight testing in a weight of 110,000 lb, it is being built up slowly in its design gross weight of 140,000 lb.

The 15th flight, the 707 topped 42,000 ft for high-altitude speed run. During these, it exceeded Mach 0.8 for a time, reached 510 psi on flaps.

So far, most of the flight testing has been devoted to general handling characteristics and checks of various control procedures in flight.

The new set of designers may get an airplane with the new handling characteristics, approach and landing speeds as contemporary transports. They accepted the fact that a jet transport had

"We had a post-flight conference which lasted about 14 min," he said. "This shows a new kind of a record flight was the end result."



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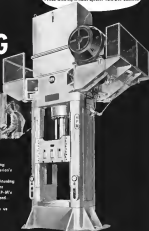
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to takeoff faster, but they wanted the same level in a piston-engine transport aircraft.

Current aircraft speed for the 737 is about 120 mph, after a run of about 3,500 ft on the runway. Even allowing for the fact that the plane is flying light, this is a respectable takeoff for a jet airplane. Fuel burnovers are flat and slow, with what appears to be plenty of glide-path and lateral control. Takeoff is on the main wheels with the wing held off to increase the drag and slow the engine.

• **What's** North-Bearing's purpose in building the 737 prototype was to have a demonstrator on hand to prove to itself or to prospective customers just what the airplane could do.

"Cost data will be one of the most important by-products of this flight test," says Ralph Bell, Boeing director of sales. "It's not easy to estimate costs for these jet jets, and we should get some excellent guidance from this one."

One engineer points out that the 737 will be neither rapid nor fast in the ITJ industry. "That's not its prime purpose at all," he says. "But it will be a very useful vehicle to get commercial engine data on operations and maintenance."

The big question remains "Who is going to buy the 737?"

Right now no one has announced any intention along these lines. It is so recent that airline personnel have been making repeated visits to Seattle to discuss drawings, look at the work-up and see the airplane itself.

But Boeing is making no effort to push commercial sales. There are all kinds of interest studies being made on price and delivery data for commercial prospects, but the real customer Boeing is trying to get is the U.S. Air Force.

"We still believe there is a positive need and a customer requirement for a jet trainer that is the engine there next to sell. Once they get a firm commitment from the military, then they will have the time to sit down and plan for commercial versions to be introduced in along the line."

This fact booklet in Seattle that this time is not in off.

## Tigers Win Payload Increase for DC-6A

Civil Aeronautics Board has approved a 2,500 lb. payload increase for the Flying Tiger Airlines DC-6A. Air Freightline is now carrying president Robert W. Fennell's prediction will increase operating revenues of the firm by as much as \$4 million a year.

Fennell calls the action "one of the most significant steps that has been

taken to make freight carriage a more profitable operation. Other DC-6A operators are expected to seek similar CAB action."

However, the present version applies only to Tigers and will not extend to other DC-6A operators. The Board's Bureau of Safety Regulation has been working for some time on a separate act of regulating for air cargo operators. Tigers' application for the waiver now gives the Board a chance to try out for one way under close control and in operation a change in present regulations. • **\$12,900-Lb. Freightline-Tiger** Tiger 5500 now operates three DC-6As on its transcontinental routes and plans to add two more of the Air Freightline type. The payload increase means each of the aircraft will be able to carry 32,000 lb. of freight instead of the present 29,500 lb.

"With such engine averaging one transcontinental flight daily, this means that we can increase our revenue by more than \$15,000 a month per airplane with only a relatively small increase in operating expense and with out any modification of the aircraft," Fennell says.

Added operating cost will be about \$10,000 a month for the three.

## Time Runs Out on McCarran Bill

CAB asks designation "supplemental air carrier" and closer regulation of non-scheduled activities.

Senate Interstate and Foreign Commerce Committee has been asked by Sen. Pat McCarran to report his 170-page amendment bill to amend the Civil Aeronautics Act to Congress.

Revolving in part bill has no chance of enactment this session, McCarran told committee members during the final day of the three-month hearing. "If this is done, it will be the final point of all thinking on the subject of aviation. It will get study and analysis during the congressional recess."

McCarran asked on bill "the picture" from which Congress can start new aviation legislation.

"If you don't report the bill," he pointed out, "I will feel that all these hearings will have been wasted because the good will have to be gone over again next year."

• **Non-scheduled Designation**—Principal point at issue during the final hearing on the bill was the role of the supplemental air carrier, a new category Civil Aeronautics Board wants to substitute for "irregular air carrier."

CAB member Joseph Adams told the committee: "The problem of supplemental service which brings before us the problem of the existence and opera-

• **Douglas Support**—CAB approval is for one year, with periodic checks by Civil Aeronautics Administration, the manufacturer and the airline. But Douglas Aircraft Co. and Air Line Pilots Assn. supported the reflight law in its bid for the annual payment.

Fennell says the newly designed for national passenger use, actually is unscheduled, as far as its safety factor for an overnight operation is concerned. Conviction of part of that excess safety factor into payload makes the DC-6A the most efficient aircraft ever built, he says.

• **Provisions**—The Board granted the waiver request with three provisions:

• **Zero** fuel weight (maximum weight of the airplane with no disposable fuel and no crew and passengers).

• **Structural** loading weight may be increased but not beyond the amount, in pounds, of the increase in the zero fuel weight.

• **Administration** must establish inspection points in addition to those normally pertaining to scheduled aircraft possible structural distress resulting from the higher operating stress levels.

• **Zero** must keep records of all DC-6A flights, including actual takeoff, zero fuel and landing weights.

Time runs out on McCarran Bill CAB asks designation "supplemental air carrier" and closer regulation of non-scheduled activities.

hen of large, irregular carriers is in operation one of the most important problems that confronts the Board."

CAB acknowledges that the definition of an irregular air carrier will be changed in the CAB's new "irregular air carrier" and a separate definition be incorporated as follows:

"A supplemental service carrier means an air carrier holding a certificate of public convenience and necessity that designates the carrier as a supplemental service carrier, which designates him as included therein on the original issuance of the certificate."

• **Certificate**—CAB also asks that the provision of the bill now dealing with irregular air carrier certification also should be amended to provide that the "authority shall, in issuing any certificate to a supplemental service carrier, include in such certificate such terms, conditions and limitations as are necessary to define the type and extent of the supplemental service authorized by such certificate and to assure that the service offered by the carrier does not exceed the authorization."

Member Adams said "I believe that the supplemental service certificate would allow the greatest opportunity for the Board to carry out your intent in























## LETTERS

### Night Choppers

I and with intent (Ed. Helicopter's on effort spent on National Aeronautics helicopter operations in the July 1 Aviation Week, and would like to study some of the points regarding C.A.A. Capt. C. E. Cason, Jr., is quoted as explaining that "the regulation prohibiting night passenger operations for single engine aircraft might... be removed in the case of the helicopter."

Actually night helicopter flights are not prohibited. However, on the subject of the intent of safety that any aircraft undergo any such night operations demonstrate that as pilots can locate a light prior to being in case of engine failure anywhere along the route. The same argument exists for day light flights. For night flying, marker lights of some kind probably would be necessary along parts of the route to identify side landing areas. National Aeronautics has made no report, in fact, to be approved for night helicopter operations.

There is a widespread misunderstanding too about the requirements for helicopter pilot ratings.

To obtain a helicopter rating on a private or commercial license, one kind requires at least one hour of rotary-wing aircraft. A pilot can obtain his license by flying fixed-wing aircraft as the total time. Thus he can supplement this with whatever rotary-wing flight time is necessary to pass the appropriate flight test. His license then permits him to fly both fixed-wing and rotary-wing aircraft while carrying passengers.

Only in the field of scheduled passenger carrying helicopters operations are a fixed number of hours' experience in operating aircraft required. This requirement stems from the necessity for maintaining a level of skill as helicopter operations are dependent to conventional aircraft transport.

Formerly, in Capt. Cason's note, 110 hours of rotary-wing time was stipulated as a condition for scheduled helicopter flights. Recently, however, that requirement has been reduced to 50 hours for pilots holding an aircraft transport rating and holding rotorcraft experience.

A. S. Kline, Director,  
Office of Aeronautics,  
Civil Aeronautics Administration,  
Washington 25, D. C.

### From an Airways Staff

It was a pleasure to read Capt. Richard's article "50 000 Feet in a DC-7" in the June 25 issue. The captain's presentation of a serious and difficult topic in a very lively manner is a lot of praise and accomplishment. The magnitude of the problem was well defined and the consequences of continued delays in its resolution were adequately brought into focus.

In my day I was in Chief of the Federal Aeronautics Flight Inspection Division. I was introduced to the importance of and the difficulties associated with this operation. However, as the years go by, flight check is available, our efforts take shape and tangibility, and

regularly are associated with little public criticism of its worth.

On behalf of the 70 pilots, inspectors and flight instructors, who comprise the Federal Bureau of Flight Inspection staff, I wish to thank Capt. Bohlen and Aviation Week for the space provided.

America's E. J. Davis, WFOC, Chief Flight Inspection Division,  
Civil Aeronautics Administration,  
Department of Commerce, Wash., D. C.

### Madsen Lights

Could you send 50 copies of your article on the Madsen lights when it appears? Just 54 in Aviation Week's "Take-Along Madsen Lights" page 60.

Thank you for the excellent coverage. The article presented a list of interest to me and many of the aviation correspondents have been most publishing. One of the most interesting developments has been with the Boeing, Hughes Co. in its new line the Boeing 787. On receiving correspondence from Boeing we had the opportunity to fly the aircraft with the lights in Seattle and display it in the Boeing people.

Andrew Morrow,  
Director of Research  
Programs, Los Angeles,  
California.

### Voluntary Censorship

Thank you for your letter of June 15, and for the assurance it contained. I thank your decision to withhold from public circulation information we have obtained about our development in aviation, especially with the progress of a real pilot's report to the nation.

Barton I. Demare,  
Director,  
National Mercury Committee  
for Aeronautics.

1715 F Street, Northwest,  
Washington 25, D. C.

(An editorial June 14 mentioned that Aviation Week reluctantly was in Madsen's office as helicopter operations dependent to conventional aircraft transport.)

A. S. Kline, Director,  
Office of Aeronautics,  
Civil Aeronautics Administration,  
Washington 25, D. C.

### Viscount Speculation

Why in about two weeks following the announcement of Capt. Bohlen's article in the magazine Viscount, have no headlines listed the helicopter topic, as mentioned in an American magazine immediately and reported in the June 25 issue of Aviation Week? How much longer would it have taken had the Viscount note been our mainstay? It would be interesting to know.

And that he must not be a million dollars, to a manufacturer, when this electronic car, toll system. Tell me! When a landing which this could have been done long ago.

Constance Campbell, I wish to see success for them to go to its outside source to support the desired equipment. But I am glad they had the courage to take the first

step. Perhaps, happily, it will go some of us out of our complacency and give us a unified and coordinated national aviation policy. Let's get on the highway! Thank you for this and for the article and we cannot afford to be second best if we hope to see this. Let's write up.

Claude W. Meyerfeld,  
528 Greenleaf Rd.  
Bloomington, Ind.

### Praise

We have at Captain Wright's very much enjoyed your very editorial comments on "United's DC-7 Record" in the June 7 Aviation Week. Of the more progressively minded writers about the "dream to death" hope, you were the first I've seen that goes beyond the plot of the publicity and long fault the significance of such a flight—why the jets are in the U.S. aviation yet.

We would like to be connected by letter as the splendid maintenance work he did in your June 14 issue as an author of the Curtiss Wright J65 subsonic engine.

Richard S. Galt,  
Director of Public Relations,  
Curtiss Wright Corp.,  
Wood Ridge, N. J.

We appreciated Frank Shuler's article in the June 7 Aviation Week. Hope you will accept these suggestions for his security and avoid the delay.

Douglas Gossard, Vice President,  
Public Relations,  
Trans World Airlines, Inc.,  
161 Madison Ave.,  
New York 17, N. Y.

I should like to order 1,000 copies of the article on the new Viscount, written by Ernest J. Behn, in the July 12 issue.

It has been mentioned with the story we highly pleased with the accuracy and the great display.

E. B. Bealman,  
E. Bealman & Co.,  
230 Park Ave.,  
New York 17, N. Y.

I have just read George Chastain's article in the June 7 Aviation Week. (New York Times Book of Jet Aircraft, p. 71). He has done a remarkable job in presenting a lot of engineering information, which no doubt will be of great interest to all who read it. I have zeroed into it with interest.

Patricia F. Hays, Assistant  
Aeromax Corp.,  
Jackson, Miss.

It was a pleasure to see the wonderful job that Boeing had done on the story of the Morrison day in the May 17 Aviation Week. The picture display was very well presented, and the story was a very accurate description of the fast and our money from it.

B. E. Barre-Morgan,  
Public & Int. Rel.  
Morrison Corp.,  
151 North Highland Ave.,  
Los Angeles 12, Calif.

**BEFORE**  
INSTALLING  
Sperry Engine  
Analyzers...  
Average monthly  
delay 654  
minutes

**AFTER**  
INSTALLING  
Sperry Engine  
Analyzers...  
Average monthly  
delay 317  
minutes

**Eastern Air Lines  
Reduces Ignition  
Delayed Time 47%**

Records show Sperry Engine Analyzers show engine number of engine hours—delayed time.

Last fall Eastern Air Lines compared their records of operations using Sperry Engine Analyzers with the same three months of the previous year before the Analyzers were installed.

Here are the results per month:

- Average number of ignition delays each month dropped from 9 to 4—a reduction of 55%.
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- Average number of defective units removed per month dropped from 37 to 17—a reduction of 54%.

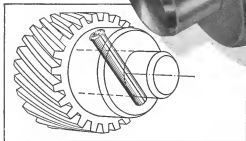
Other savings, too.

These savings relate only to ignition—distributors, distributor fingers, ignition coils, ignition leads, magnets and spark plugs. When you consider the additional savings in fuel from more efficient engine operations, it's easy to see why Eastern's latest four-engine fleet is now being equipped with Sperry Engine Analyzers—now why they've been specified for Eastern's latest four-engine DC-8s.

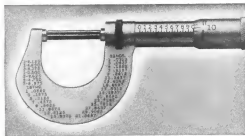
For a full and complete description of the Sperry Engine Analyzer, contact your nearest Sperry Gyroscopic Company distributor or write to: Sperry Gyroscopic Company, 1000 Broadway, New York 10, N. Y.

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a rivet

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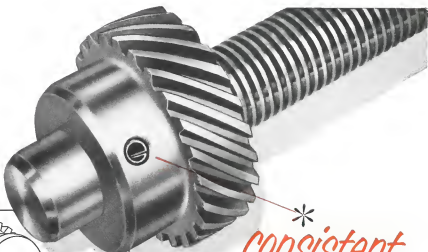
a hinge pin



a dowel



a set screw



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quality*

is as important  
in the pin as in  
the gear

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